

The University reserves the right to make changes as required in course offerings, curricula, academic policies and other rules and regulations affecting students, to be effective whenever determined by the University. These changes will govern current and formerly enrolled students. Enrollment of all students is subject to these conditions.

Fully accredited by the Southern Association of Colleges and Schools since 1922.

Bulletin of
Auburn University
A Land-Grant University

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AUBURN, ALABAMA
CATALOG NUMBER 1981-82



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Board of Trustees

UNDER THE ORGANIC and statutory laws of Alabama, Auburn University is governed by a Board of Trustees consisting of one member from each congressional district, as these districts were constituted on January 1, 1961, an extra member from the congressional district in which the institution is located, and the Governor and State Superintendent of Education, who are members *ex officio*. The Governor is Chairman. Members of the Board of Trustees are appointed by the Governor by and with the advice and consent of the State Senate and hold office for terms of twelve years. Members of the board receive no compensation. Trustees serve until reappointed or their successors are named. By executive order of the Governor in 1971, a non-voting student representative, selected by the Student Senate, serves as a member *ex officio*.

The Board of Trustees places administrative authority and responsibility in the hands of an administrative officer at Auburn University. The institution is grouped for administrative purposes into divisions, schools, and departments.

MEMBERS EX OFFICIO

FOB JAMES, Governor of Alabama, <i>Chairman</i>	Montgomery
WAYNE TEAGUE, State Superintendent of Education	Montgomery
Student Body Representative, non-voting	Main Campus
Student Body Representative, non-voting Auburn University at Montgomery	

APPOINTED MEMBERS

TERMS ENDING IN 1983

R.C. BAMBERG, *Vice Chairman*, Uniontown, Sixth Congressional District
CHARLES M. SMITH, III, Montgomery, Second Congressional District
ROBERT H. HARRIS, Decatur, Eighth Congressional District

TERMS ENDING IN 1987

JOHN W. PACE, III, Mobile, First Congressional District
HENRY B. STEAGALL, II, Ozark, Third Congressional District
JOHN V. DENSON, Opelika, Third Congressional District
FRANK P. SAMFORD, JR., Birmingham, Ninth Congressional District

TERMS ENDING IN 1991

BILL NICHOLS, Sylacauga, Fourth Congressional District
MICHAEL B. MCCARTNEY, Gadsden, Fifth Congressional District
MORRIS W. SAVAGE, Jasper, Seventh Congressional District

Executive Council of the University

H. HANLY FUNDERBURK, JR., B.S., M.S., PH.D.
President

J. GRADY COX, B.S., M.S., PH.D.
Executive Vice President

STANLEY P. WILSON, B.S., M.S., PH.D.
*Vice President for Agriculture, Home Economics, and
Veterinary Medicine*

GEORGE L. BRADBERRY, B.S.
*Executive Director of Alumni Association and
Director of Development*

TO BE NAMED
Director of Athletics

DANIEL C. HOLSENBECK, B.S., M.Ed., PH.D.
Director of University Relations

GROVER T. JACOBS, B.S., M.S., L.L.B., Ed.D.
Financial Adviser to the President

JAMES O. WILLIAMS, B.S., M.Ed., Ed.D.
Chancellor, Auburn University at Montgomery

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UNIVERSITY CALENDAR
1981-82**1981—Summer Quarter** (46 class days) and
Eight-Week Term (36 class days)May 27, *Wed.* Last day for completing
applications for admissionJune 16, *Tues.* Orientation for new studentsJune 17, *Wed.* Final Registration and
Schedule AdjustmentJune 18, *Thurs.* Classes beginJuly 3, *Fri.* Independence Day
HolidayJuly 20-24, *Mon.-Fri.* *Registration for
Fall QuarterJuly 23, *Thurs.* Mid-quarterAug. 7, *Fri.* Classes end for termAug. 10-11, *Mon.-Tues.* Final Exams
for termAug. 21, *Fri.* Classes end for quarterAug. 24, 25, 26, 27, *Mon., Tues., Wed.,
Thurs.* Final ExamsAug. 28, *Fri.* Graduation, 2:30 p.m.**1981—Fall Quarter** (48½ class days)Sept. 1, *Tues.* Last day for completing
applications for admissionSept. 21, *Mon.* Orientation for
new studentsSept. 22-23, *Tues.-Wed.* Final Registration
and Schedule AdjustmentSept. 24, *Thurs.* Classes beginOct. 13, *Tues.* General Faculty MeetingOct. 22-Nov. 3, *Thurs.-Tues.* *Registration
for Winter QuarterOct. 28, *Wed.* Mid-quarterNov. 25-29, *Wed.-Noon-Sun.* Thanks-
giving HolidaysNov. 30-Dec. 4, *Mon.-Fri.* Schedule Distribu-
tion and Fee Payment for Winter QuarterDec. 3, *Thurs.* Classes endDec. 4, *Fri.* Dead DayDec. 5, 7, 8, 9, *Sat., Mon., Tues.,
Wed.* Final ExamsDec. 10, *Thurs.* Graduation**1982—Winter Quarter** (47 class days)Dec. 14, *Mon.* Last day for completing
applications for admissionJan. 4-5, *Mon.-Tues.* Final Registration
and Schedule AdjustmentJan. 6, *Wed.* Classes beginFeb. 2-12, *Tues.-Fri.* *Registration
for Spring QuarterFeb. 9, *Tues.* Mid-quarter

UNIVERSITY CALENDAR 1982

Mar. 8-11, *Mon.-Thurs.* . . . Schedule Distribu-

tion and Fee Payment for Spring Quarter

Mar. 11, *Thurs.* Classes end

Mar. 12, *Fri.* Dead Day

Mar. 13, 15-17, *Sat., Mon., Tues., Wed.* . . . Final

Exams

Mar. 18, *Thurs.* Graduation, 2:30 p.m.

1982—Spring Quarter (48 class days)

Mar. 4, *Thurs.* Last day for completing
applications for admission

Mar. 25-26, *Thurs.-Fri.* Final Registration
and Schedule Adjustment

Mar. 29, *Mon.* Classes begin

Apr. 20, *Tues.* General Faculty Meeting

Apr. 26-May 6, *Mon.-Thurs.* . . . *Registration
for Summer or Fall Quarter

Apr. 30, *Fri.* Mid-quarter

May 31-June 2, *Mon.-Wed.* Schedule Distribu-
tion and Fee Payment for Summer Quarter

June 2, *Wed.* Classes end

June 3, *Thurs.* Dead Day

June 4-5, 7-8, *Fri., Sat., Mon., Tues.* . . . Final

Exams

June 10, *Thurs.* Graduation

**1982—Summer Quarter (46 class days) and Eight-Week Term (36 class days)

May 26, *Wed.* Last day for completing
applications for admission

June 15, *Tues.* Orientation for new
students

June 16, *Wed.* Final Registration and
Schedule Adjustment

June 17, *Thurs.* Classes begin

July 5, *Mon.* Independence Day Holiday

July 12-16, *Mon.-Fri.* *Registration for
Fall Quarter

July 22, *Thurs.* Mid-quarter

Aug. 6, *Fri.* Classes end for term

Aug. 9-10, *Mon.-Tues.* Final Exams
for term

Aug. 20, *Fri.* Classes end for quarter

Aug. 23, 24, 25, 26, *Mon., Tues.,*

Wed., Thurs. Final Exams

Aug. 27, *Fri.* Graduation

NOTE: Schedule distribution and fee payment for Fall Quarter will be
accomplished by mail prior to the opening of the quarter.

*The individual schools will publish the days of registration that will be
utilized during the nine-day University registration period.

**All dates in the Summer Quarter are tentative and are subject to final
approval prior to 1982-83 catalog printing

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The University

AUBURN UNIVERSITY, chartered in 1856, is located in Auburn, Alabama, on Interstate 85 in the eastern section of the state. Surrounded by farms and woodlands, the University enjoys the advantages of the security, seclusion, and clear air afforded by a small residential city. The 1,871-acre campus, with 71 major buildings, uncrowded and uncluttered, is distinguished by its buildings, lawns and flowers, trees and playing fields. Ten Undergraduate Schools and a Graduate School have emerged to define and carry out the purposes of the institution. The academic program is fully accredited by the Southern Association of Colleges and Schools.

As a land-grant university, Auburn is dedicated to service to Alabama and the nation through its three divisions of instruction, research, and extension. Instruction is the academic process on campus between professors and students. Research is carried on continually to increase knowledge. Extension programs provide educational services and special assistance throughout the state.

Auburn is proud of its graduates, many of whom have distinguished themselves in the professions, business and industry, government and military service, politics, and athletics. Some 100,000 persons have earned Auburn degrees.

The University traces its beginning to the East Alabama Male College, a private liberal arts institution whose doors opened in 1859. From 1861 to 1866 the college was closed because of the Civil War. The college had begun an affiliation with the Methodist Church before the war. Due to financial straits, the church transferred legal control of the institution to the state in 1872, making it the first land-grant college in the South to be established separate from the state university. It thus became the Agricultural and Mechanical College of Alabama.

Women were admitted in 1892, and in 1899 the name again was changed, to the Alabama Polytechnic Institute. In 1960, the school acquired a more appropriate name, Auburn University, a title more in keeping with its location, size, and complexity. The institution has experienced its greatest growth since World War II, and today enrolls 18,100 students, the largest on-campus enrollment in the state. The majority are Alabama residents.

Auburn University at Montgomery was established as a branch campus in 1967. The institution has developed rapidly, especially since moving to a new 500-acre campus just east of Montgomery in 1971. The AUM enrollment now stands at 4,800.

Purpose of the University

Auburn's responsibility as a University is to maintain an environment of learning in which the individual and society are enriched by the preservation, transmission, and creation of knowledge. This obligation embraces Auburn's continuing commitment to its land-grant traditions as well as its consciousness of involvement into a dynamic and complex institution whose programs of instruction, research and extension must be ever pertinent to the needs of a changing social order.

Auburn University, therefore, is dedicated to these purposes:

Providing for its students, within the resources of the institution, educational opportunities of a liberal character as well as those of a specialized nature;

Developing graduates whose knowledge, intellectual discipline, and awareness of the morality of individual action will be manifest in service to their fellow man and to the state and nation;

Conducting a broad program of faculty, undergraduate and graduate research, both basic and applied, to stimulate the faculty and students in their quest for knowledge, to promote their intellectual growth and development, to broaden the foundations of knowledge, to increase understanding of today's and tomorrow's world, and to aid society in resolving its scientific, technological and social problems;

Creating and implementing effective programs of education and service which will extend the scientific and cultural resources of the University to individuals, communities, institutions, and industries, thereby contributing to an improved technology, better environmental and health conditions, enhancement of the general level of living, and the development of more responsible citizenship;

Encouraging scholarly and creative effort in the arts, humanities, and sciences so that the University may serve its students and the community at large as a vital source of cultural enlightenment and as a stimulus toward their participation in the intellectual life; and

Reassessing continuously the value of particular objectives and programs of the University in order to make them accord with new knowledge and changing social conditions; and as a part of this reassessment to seek ever more efficient and imaginative means of fulfilling the University's purposes.

Research

Research is a major responsibility of Auburn University. In the early years investigation and discovery were largely confined to scientific areas. More recently research has embraced humanistic fields and creativity in the arts as well. The creation of knowledge by faculty and students is encouraged; steady growth in programs of basic and applied research find a direct parallel in the institution's increasing percentage of graduate enrollment.

The Agricultural Experiment Station was established in 1887 to conduct research, acquire information, and promote scientific investigation in agriculture. It utilizes some 23,000 acres statewide. The Engineering Experiment Station was established in 1929 to assist industries in manufacturing processes and to develop natural resources. The Water Resources Research Institute began in 1963 to promote research and the training of scientists in water resources.

Auburn's fastest growing research area is sponsored research—an activity annually involving a multi-million dollar program of contracts and grants, supported by federal, state, and private agencies; all of which bears witness to the University's research capability.

Extension

Extension, another of Auburn's principal responsibilities, involves developing and carrying educational services to the farms, homes, industries, communities, and municipalities of the state. The Cooperative Extension Service has provided such services to Alabama's 67 counties since 1914. Included are programs for agriculture and natural resources, home economics, community resource development, and youth activities.

Extension and continuing education programs are available through the Engineering Extension Service, the Schools of Architecture and Fine Arts, Arts and Sciences, Business, Education, Pharmacy and Veterinary Medicine. In addition, the Office of Continuing Education conducts a large number of noncredit, community-oriented short courses to provide background for further study, cultural development, and renewal of professional skills.

Also, Educational Television presents public service programs, and the University library cooperates with public libraries to make materials available throughout the State. Several specialized extension programs such as the Office of Public Service and Research, the Continuous Professional Development Program, the Energy Extension Service and the Auburn Technical Assistance Center provide additional dimensions of service to the people of Alabama.

Instruction

Instruction of students is the primary mission of the University. In the classroom, the laboratory, the library, Auburn University's goals are to quicken the student to reach his full potential, instilling respect for intellectual inquiry and understanding of cultural tradition; and to equip him with the knowledge and skills which he will need in a demanding and increasingly complex society.

The University faculty offers specialized instruction leading to the bachelor's degree in 138 fields in 58 departments, the master's degree in 52 fields, and the doctorate in 29 areas. The faculty and curricula are organized into 10 undergraduate schools: the *School of Agriculture*, the *School of Architecture and Fine Arts*, the *School of Arts and Sciences*, the *School of Business*, the *School of Education*, the *School of Engineering*, the *School of Home Economics*, the *School of Nursing*, the *School of Pharmacy*, the *School of Veterinary Medicine*, and the *Graduate School*.

Auburn University at Montgomery offers the baccalaureate and the master's degrees.

On the Auburn campus, military instruction is available in Air, Military, and Naval Science basic and advanced programs.

Liberal Education Program

The University's instructional program for undergraduates specifies that each student complete a component of general studies in addition to the requirements of his School or departmental major: this general work covers a foundation year of courses in English composition; world history, art history, or literature; natural science; mathematics or philosophy; and physical education; and is to be taken during the lower-division years, primarily at the freshman level. A certain number of hours must also be completed in elective courses lying outside the student's major area, these to be taken, in part at least, during the upper-division years.

The goals of this "experience in breadth" are to some extent intangible: the development in the student of the values of tolerance, intellectual honesty, and a capacity for reflective judgment. More specifically, it is hoped that the student will acquire also an ability to order his thoughts in a clearly expressed and reasoned manner; attain a grasp of the scientific method and discipline; develop some understanding of his culture and its backgrounds; and come to perceive the vital issues of our common life as citizens in a complex and changing world.

The minimal University requirements for all students are listed below; however the student should consult the appropriate curriculum model in his School for complete requirements.

Requirement	Hours	Option
English Composition EH 101-102-103 (3-3-3)	9	
History or Literature	9	World History 101-102-103 (3-3-3) or Technology & Civilization 204-205-206 (3-3-3) or World Literature (EH) 260-261-262 (3-3-3) or Art History 171-172-173 (3-3-3)
Natural Science	minimum of 10	Biology 101-102-103 (5-5-5) 101-104 (5-5) Biology 101-201 (5-5) Chemistry 103-104 (5-5) 101-102-104 (2-3-5) Geology 101 (5), 102 (5), 103 (5), 110 (5) Physics 205-206 (5-5) Physical Science 100-101 (5-5)
Mathematics or Philosophy	minimum of 5	Mathematics 100 (5), 140-161 (5-5), 151-161 (5-5), 160-161 (5-5) Philosophy 202 (5), 210 (3), 211-212 (3-3), 214 (3), 216 (3)
Electives or Area Requirements	minimum of 20	Additional hours of liberal education studies will consist of coursework in two broad academic areas other than that in which the student's own major field lies (Humanities and Fine Arts, Social Sciences, Math- ematics and Natural Science), with no less than one course in each area.

English Composition Requirements

No substitution for the freshman English requirement is permitted.

Credit in freshman English composition earned at another institution may be allowed on transfer as follows, except that no grade less than C will be accepted.

1. If the transfer student has fewer than three quarter hours of credit in freshman English composition, no credit is allowed. If he has three quarter hours credit in the first course of an English composition sequence, he must complete both EH 102 and 103.
2. If the transfer student has four quarter hours of credit in the first course of a three-course sequence, he must complete EH 102 and 103.
3. If the transfer student has either four or five quarter hours of credit in the first course of a two-course sequence, he must complete EH 103.
4. If the transfer student has three semester hours of credit in the first course of a two-course sequence, he must complete EH 103.
5. If the transfer student has earned eight or more quarter hours and has met the first year English composition requirement of the other institution, credit may be allowed for EH 101-102-103, provided the minimum of eight hours involves no duplication. A total of 12 hours may be accepted toward the graduation requirement when the 12 hours of work represents a continuous course sequence at one school. Students entering an undergraduate school at Auburn University after receiving a bachelor's degree from another accredited college or university are exempted from meeting these regulations.
6. No student failing a freshman English composition course at Auburn will be permitted to transfer credit from another school to offset that F, but must repeat the course in residence at Auburn.

All transfer students are directed to clear their freshman English composition credits with the Registrar as soon as possible after enrolling at Auburn University.

History—Literature Requirements

One of the purposes of the University's Liberal Education Program is to give the student an understanding of his culture and its backgrounds. Course sequences designed especially for this purpose are those in world history, world literature, technology and civilization, and art history. Students must earn nine hours of credit in one of these sequences.

Credit in history or literature earned at another institution may be allowed on transfer as shown below in meeting this particular requirement. The student's dean may require a C grade for a course to transfer.

1. If a transfer student has three or four quarter hours of credit in the first course of a three course sequence in history or literature, he must complete HY 102 and 103, HY 205 and 206, AT 172 and 173, or EH 261 and 262.
2. If a transfer student has four or five quarter hours of credit in the first course of a two course sequence, he must complete HY 103, HY 206, AT 173, or EH 262.
3. If a transfer student has earned eight or more quarter hours in a history or literature area and has completed the standard history or literature requirement of the other institution, he may be excused from this particular requirement in the Liberal Education Program.
4. If a student enters an undergraduate school at Auburn after receiving a bachelor's degree from an accredited university, he may be exempted from the history-literature requirement unless his curriculum major or minor specifies one of the four sequences described in this section.

Libraries

The Ralph Brown Draughon Library, with branch libraries maintained in the School of Architecture and Fine Arts and in the School of Veterinary Medicine, is the main library.

Current holdings include over 1,100,000 bound volumes and 1,300,000 volumes and items in microformat. The library is a depository for government documents and lists among its serial subscriptions more than 7,500 periodicals and 141 newspapers. Special collections include an Alabama Collection, 82,000 maps and other special materials.

Library staff members offer assistance in the location and use of library materials at the General Information and Humanities Desk, and at desks in the Social Sciences Department, Science and Technology Department, Special Collections, and the Microforms and Government Documents Center. Desks are also maintained in the two branch libraries.

A convenient open-shelf arrangement of the main collection makes material readily accessible. Comfortable, well-lighted study areas are available, including carrels which graduate students and faculty may reserve.

Archives

The Archives was established in 1964 and now has 585 University and personal manuscript collections; 1,300 oral history and recorded sound tapes; 33,500 prints and negatives; and 900 rolls of microfilm available for research use. The Archives operates the Records Management program for the University.

Computing and Data Processing

Services of this type are provided by the Division of Computing and Data Processing. The Division has three component units: Computer Services, Information Systems and Minicomputer Facilities.

Computer Services operates central computing equipment in support of Instruction, Research, Extension, and Administration. An IBM 3031 computer handles academic computing, and administrative processing is handled by an IBM 370/158 computer. Input-output stations, both interactive and batch, are provided in several locations on the campus. All use of these large computers is coordinated through heads of academic and administrative departments. Request forms for services are available in 144 Parker Hall.

Information Systems provides systems analysis and programming services in support of University administration.

Minicomputer Facilities operates two smaller computers, free of charge, for support of instruction. The HP2000 and PDP 11-70 computers, with associated terminals, are located in the "L" Building.

The Division of Computing and Data Processing is a service organization, and does not conduct an academic program in Computer Science, although some staff members participate as faculty in the program. Inquiries concerning the academic program should be directed to the Dean of Engineering School; some information is contained in this catalog pertaining to this program.

Revenues

Auburn University receives financial support from student fees, state and federal appropriations, endowments, income from clinical services, sales, gifts, grants, contracts, and other sources. The largest single source of income is state appropriations.

Student Affairs

The Division of Student Affairs, under the direction of the Dean of Students, administers services and programs for students, faculty, staff, and alumni. Areas of involvement of this division include Admissions, Career Development, Financial Aid, Food Services, Foy Union Building, High School and Junior College Relations, Housing, Recreational Services, Registrar, Student Health Services, Student Activities, and Student Information Systems.

Admissions

AUBURN UNIVERSITY is an equal opportunity educational institution and, as such, does not discriminate in its admissions policy on the basis of race, color, sex, creed, handicap, age or national origin. Preference is given to the admission of Alabama residents at the undergraduate level; in considering applications to professional schools or programs with restrictive admissions policies, the length of residency in the state will be a factor.

Applications from out-of-state residents will be accepted for all curricula; however, the number of nonresidents who are admitted will be determined by the availability of facilities and faculty.

Application to any undergraduate school or curriculum of the University must be made to the Admissions Office, Auburn University, Alabama 36849. Application forms and instructions can be obtained from the Admissions Office. Application to the Graduate School or the School of Veterinary Medicine must be made to those schools.

Individuals may apply for entrance to any quarter of a calendar year as early as August 15 of the preceding year.* Because of the large number of applications, credentials should be submitted at the earliest possible time. In all cases, complete credentials along with the physical examination report must be filed at least three weeks before the quarter's opening. The University reserves the right to establish earlier deadlines should circumstances warrant such action.

A \$15 processing fee must accompany all admission applications and is neither refundable nor applicable to other fees. Responses on the application forms and on related materials must be complete and accurate; entrance may be denied or registration cancelled as a result of false or misleading statements.

An applicant may receive provisional acceptance after he submits the application form and current academic documents. However, he must complete and return a medical examination report at least three weeks before the quarter opens. The University provides the medical report form; it also may require additional medical examinations if such appear advisable, and it may refuse admission to any individual whose health record indicates that his health or the University community might be adversely affected by his attendance.

Each applicant must furnish satisfactory evidence of good character. The University may deny admission to those whose presence is deemed detrimental to the institution or its students.

*Applicants to Veterinary Medicine will be admitted in the Fall Quarter only. See page 179.

Admission of Freshmen

Enrollment limitations for freshmen have been established by curricula and schools, in proportion to available faculty and facilities. Favorable consideration for admission will be given to accredited secondary school graduates whose college ability test scores and high school grades give promise of success in college courses.

All secondary school students planning to apply for admission to Auburn should emphasize the following high school courses: English, mathematics, social studies, sciences, and foreign languages. A minimum of 16 high school units is required for admission. Four of these units may be vocational subjects.

Alabama residents are required to take the American College Test (ACT) on one of the announced national testing dates. Applicants from other states may present scores from either the ACT or the Scholastic Aptitude Test (SAT) of the College Entrance Examination Board. High school students may secure application forms from their principals or counselors. Scores on these tests are used as a partial basis for admission, for placement in English, chemistry, and mathematics, and for awarding University scholarships and loans.

Prospective freshmen who take the ACT or SAT, list Auburn as a score recipient and meet freshman entrance requirements will be mailed a preprinted application completed from information supplied to the testing service by the student.

At least one unit of college preparatory mathematics (algebra or geometry) is required for admission to any curriculum in the University. Curricula which list Mathematics 140 or 160 assume the student's competence in the mathematics taught in high school geometry and second year algebra. Curricula which list MH 161 as a first college course in mathematics presume, additionally, competence in high school "analysis" (the function concept, graphs of functions, the trigonometric functions).

A deficiency in the latter material can be remedied by taking MH 160. However, Auburn University offers no course comparable to high school geometry or to first and second year high school algebra. MH 140 can serve as a refresher course, but credit is not allowed for both 140 and MH 160. MH 100 is not a preparatory course for any of the above college-level courses.

Applicants whose native language is not English may be required to demonstrate proficiency in English.

Applicants of mature age who are not high school graduates may be considered for admission if their educational attainments—through testing—are shown to be equivalent to those of a high school graduate. The tests used include the USAFI General Educational Development Test, the American College Test and/or other tests recommended by the Admissions Committee. Applicants from nonaccredited high schools will be considered on an individual basis by the Committee.

Early Admission—A student of high academic promise may be admitted directly from the eleventh grade without a diploma. Basic requirements for early admission include:

1. Proper personal qualifications.
2. Superior competence and preparation, evidenced by the high school record and college aptitude test scores (ACT, SAT or other tests prescribed by the University Admissions Committee).
3. A letter from the high school principal assessing the applicant's emotional and social maturity, and readiness for college work.

Additional information on procedure is available at the Admissions Office.

Advanced Standing—Students with superior preparation may be placed in advanced programs suited to their ability and academic background. Individuals with special competence may qualify for advanced placement or credit on the basis of high school grades, scores on college ability or achievement tests, the College Level Examination Program (CLEP) tests, proficiency tests, and military courses. See page 31.

Admission of Transfer Students

An applicant who was not eligible for admission to the University when he graduated from high school must present a minimum of 48 quarter hours or 32 semester hours of college credit with C's or better in college-level English composition courses to qualify for consideration as a transfer.

For residents of Alabama or other states who are party to the Southern Regional Education Board*, a satisfactory citizenship record, an overall C average (2.0 on a 4.0 system) or better on all courses attempted, and eligibility to re-enter the institution last attended are required for transfer admission. Residents of states not affiliated with the SREB must present at least a B average in addition to the other requirements. Entrance examinations may be required of applicants transferring from colleges with which the University has had little or no experience.

An additional requirement for applicants wishing to enter the School of Business is the satisfactory completion of the first course in college calculus with a grade of C or better.

The School of Engineering requires an overall grade point average of 2.5 for all curricula except Textile Management and Technology. In addition, the first course in college calculus with a grade of C or better is required for all curricula except Textile Management and Technology and Aviation Management.

Transfer Credit—The amount of transfer credit and advanced standing allowed will be determined by the appropriate dean and the registrar. The dean will determine acceptance of D grades; credit in freshman English is allowed only on grades of C or better. See page 12. The maximum credit allowed for work completed in a junior college will not exceed the number of hours required in the first two years of the student's curriculum at Auburn.

Students transferring from unaccredited institutions or programs may be granted provisional credit. When such credit is allowed, the final amount of credit will be determined upon completion by the student of one year of course work at Auburn University. If a C average is not achieved, the amount of credit will be reduced in proportion to the number of hours in which the student fails to earn a C average or better.

Transfer Within the System

Auburn University maintains a branch campus at Montgomery, Alabama. An undergraduate enrolled at either of Auburn's campuses who wishes to transfer to the other campus will be considered as a transfer student from any other accredited college. Because there is a slight difference between some curricula and courses at the two institutions, transfer credit and advanced standing will be determined by the academic unit and the registrar at the campus to which the student is moving.

Admission of Transient Students

A student in good standing in an accredited college may be admitted to the University as a transient student when faculty and facilities are available.

To be eligible for consideration, an applicant must submit an application, an acceptable medical report and a letter of good standing bearing the signature of the dean or registrar of the college in which the applicant is currently enrolled.

*The fourteen states participating in the Southern Regional Educational Board's compact are Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, South Carolina, Tennessee, Texas, Virginia, and West Virginia.

Permission to enroll is granted for one quarter only; a transient student who wishes to re-enroll must submit a new application. Transient status does not constitute admission or matriculation as a degree candidate. The transient is, however, subject to the same fees and regulations as a regular student except for the physical education and continuation-in-residence requirements.

Admission of Unclassified Students

For residents of Alabama and other states affiliated with the Southern Regional Education Board, admission to undergraduate programs as an Unclassified Student may be granted on the basis of the bachelor's degree from an accredited college. For residents of states not affiliated with the SREB, Unclassified Student enrollment may be allowed on the basis of the bachelor's degree and an overall B average. Unclassified students must submit the same admissions credentials as transfer applicants.

Admission of Special Students

Persons who cannot meet freshman admission requirements but who are otherwise adequately prepared for University courses may be admitted as special students on approval of the Admissions Committee and the dean concerned. Course credits earned by special students generally cannot be used toward a degree at Auburn University.

Admission of International Students

The University welcomes admission inquiries from international students. Because of limited facilities, however, only those students who are academically strong will be given serious consideration for admission. Also, the international student should be proficient in English. In all cases, English proficiency is determined by satisfactory results on the Test of English as a Foreign Language (TOEFL), offered by the Educational Testing Service, Box 899, Princeton, N.J., 08540, U.S.A. The student must submit satisfactory results on the Scholastic Aptitude Test of the College Entrance Examination Board, also offered by the Educational Testing Service.

An international student first should send all of his academic credentials to the Admissions Office for evaluation. If he appears to be qualified, and shows promise of success in his chosen field of study, he will then be asked to make formal application. The application must be accompanied by a recent photograph and an application fee of \$15 (not refundable). If the applicant presents satisfactory academic credentials, test results, and evidence that he has sufficient funds to meet his college expenses (there is no financial assistance for undergraduate international students), he will then be sent an acceptance and the form I-20, the authorization for a student visa. All international students are required to subscribe to Plan II of the student insurance plan or provide evidence of equivalent coverage. Information about student insurance is available at the Drake Student Health Center. For further information, prospective students should write to the Admissions Office, Auburn University, Auburn University, Alabama 36849, U.S.A.

Admission of Auditors

When faculty and facilities are available, an individual who does not seek admission for course credit may audit a lecture course or the lecture portion of a course upon approval by the Admissions Office, the dean, and the head of the department involved. A formal application must be filed, but the \$15 application fee and the physical examination report are not required. (See Auditing Privilege, page 25.)

Admission to Graduate Standing

Admission to graduate standing is granted only by the University Graduate School. A \$15 application fee is required. A bachelor's degree or equivalent from an accredited college or university and submission of satisfactory scores on the Aptitude Test of the Graduate Record Examination are required for Graduate School admission. Applicants for admission to doctoral programs must submit Advanced Test scores also. Certain departments require applicants to master's degree programs to take the Advanced Test.

The undergraduate preparation of each applicant must also satisfy the requirements of a screening committee of the school or department in which the student plans to major. A student in good standing in a recognized graduate school who wishes to enroll in summer session, off-campus workshop, or short session, and who plans to return to his former college, may be admitted as a graduate transient. For further information, see the section on the Graduate School and also the Graduate School Bulletin.

Readmission

Students who have previously attended Auburn and who wish to re-enter must secure a registration permit from the Registrar's Office. Former students who have attended another college for at least one quarter or semester must be eligible to re-enter that institution, if they desire to return to Auburn. Students who attended another institution for more than one quarter must have earned an overall C average or better to be eligible to re-enter Auburn. Two transcripts from the institution attended must be supplied to the Registrar.

Pre-College Counseling

In order to help entering freshmen and transfer students choose fields of study, and to adjust to their first quarter at the University, Auburn provides pre-college counseling.

Freshmen entering Fall Quarter attend counseling sessions on campus during the summer prior to entrance. In these sessions, students meet faculty members, administrators, and student leaders, and plan with their advisers a schedule of their first quarter of college work.

Freshmen entering the University any quarter other than Fall Quarter are usually required to report to campus one day early for counseling.

Transfer students may meet with advisers during the regular pre-registration period for the quarter in which they plan to enroll. Transfers will plan their schedules after their transcripts have been evaluated. A convocation for all transfer students is held on the first day of registration prior to the beginning of classes.

Alabama and Non-Alabama Student Policy

For the purpose of assessing fees, applicants shall be classified as Alabama or non-Alabama students. Non-Alabama students except graduate students are required to pay a tuition fee.

An Alabama student is a person who shall be a citizen of the United States or a resident alien and who shall have resided and had his habitation, home, and permanent abode in the State of Alabama for at least 12 months immediately preceding his current registration. In applying this regulation, "applicant" shall mean a person applying for admission to the institution if he is married or 19 years of age, or, otherwise, it shall mean parents, parent or legal guardian of his or her person. If the parents are divorced residence will be determined by the residency of the parent to whom the court has

granted custody. A student shall be classified as an Alabama student when his parent(s) or legal guardian establishes domicile within the state and is employed full-time in a permanent position in the state.

In the determining of an Alabama student for purposes of assessing fees, the burden of proof is on the applicant. An applicant can change his status from non-Alabama to Alabama student only by actually and physically coming into the state for the required period with the intention of residing within the state.

A non-Alabama student may apply in writing for reclassification prior to any subsequent registration. To qualify for reclassification as an Alabama student, the applicant (1) shall present evidence of having resided in Alabama for 12 consecutive months preceding his request for reclassification, (2) shall submit evidence that he has met the usual and expected obligations of an Alabama citizen, and (3) shall file a declaration of intent to reside in Alabama. An alien shall have resided in Alabama for 12 months and must present U.S. Immigration and Naturalization certification that he is a resident alien. If the application is supported by evidence satisfactory to the University that the student then qualifies as an Alabama student, his classification may be changed for future registrations.

Members of the Armed Forces who are on active duty and who have an Alabama Home of Record and their dependents shall not be liable for non-Alabama tuition. Verification of the Alabama Home of Record must be attested to by military authority for a minimum period of one year before entry of the student.

The registrar shall have the responsibility for determining whether a student shall be classified as an Alabama or non-Alabama student. The decision of the registrar shall be subject to review by the President or his designated representative upon written request of the applicant.

Fees and Charges

Auburn University's fees have remained somewhat lower than those charged by similar institutions in the Southeast and in other sections of the country. As institutional costs have risen, small increases in fees have been authorized from time to time by the Board of Trustees. Every effort is made, however, to hold fees and charges at a minimum.

The following fees and charges are in effect at this time. However, since the catalog must be published well in advance of the next school year, it is not always possible to anticipate changes. **Thus the fee schedule may have to be revised. Every effort will be made to publicize changes as far in advance as possible.**

Payment of Fees and Charges—Students are expected to meet all financial obligations when they fall due. The University reserves the right to deny admission to or to disenroll and withhold transcripts of any student who fails to meet promptly his financial obligations to the University. It is each student's responsibility to be informed of all registration and fee payment dates, deadlines, and other requirements by referring to the official calendar of events in the catalog, announcements printed in the *Plainsman*, or disseminated by other means from time to time. Where necessary, students should inform their parents of the deadline dates, and the necessity for meeting them.

Checks—Checks given in payment of fees and charges are accepted subject to final payment. If the student's bank does not honor the demand for payment and returns the check unpaid, the student will pay the applicable late penalty fee of \$10 or \$20. If payment is not cleared promptly, the student's registration will be cancelled.

Veterans—Veterans enrolled under the federal GI Bills P.L. 358 and P.L. 634 receive their allowances directly from the Government and are responsible for paying their fees and charges on the same basis as other students. This does not apply to P.L. 894 or P.L. 815.

Any collection costs or charges with all attorneys fees necessary for the collection of any debt to the University will be charged to and paid by the debtor. Questions about charges or refunds should be addressed to the Assistant Treasurer.

Foreign Students - Under Contract—For those foreign students who come to the University under a contractual arrangement that requires special administrative and programming arrangements beyond those of the regular academic program of the University, a special administration/management/program fee will be negotiated.

Basic Quarterly Charges

Students should be prepared to complete registration by payment of fees and charges, upon notice, two to three weeks before the beginning of the quarter. See fee payment dates in the Calendar, pages 6-7.

ENROLLMENT FOR TEN OR MORE CREDIT HOURS

University and Student Activities Fee (all curricula except Veterinary Medicine)	\$240.00
University and Student Activities Fee for Veterinary Medicine	340.00

The University Fee is used to meet part of the cost of instruction, physical training and development, laboratory materials and supplies for student's use, maintenance, operation, and expansion of the physical plant, Library, Student Health Services and Student Activities.

The Student Activities portion of the fee supports such activities on campus as intercollegiate athletics, exhibits, *Glomerata*, intramural sports, *Plainsman*, religious life, social affairs, student government, student union activities and operations, *Tiger Cub*, and WEGL Radio Station. This fee includes 25¢ held in reserve to cover unnecessary damage to University property by students.

Non-Alabama Fee	\$240.00
Additional fee charged all non-Alabama undergraduate, special, and unclassified students taking 10 or more hours.	

ENROLLMENT FOR FEWER THAN TEN CREDIT HOURS

Registration Fee	50.00
Additional fee per credit hour	19.00

No additional charge is made beyond 10 hours. Students who register for 10 or more hours will pay a maximum of \$240.00 as Alabama students or \$480.00 as non-Alabama students. The \$50.00 registration fee is remitted to full-time faculty and staff taking no more than five credit hours. All students except faculty and staff are eligible to participate in Student Health Services and Student Activities.

Clearing for Graduation Fee	50.00
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A student who is a candidate for a degree in a quarter in which no credit work is taken is required to register in such quarter as a prerequisite to graduation. (For members of the faculty and staff the charge shall be reduced to \$5.00) Graduation fee is to be paid in addition to this charge.

Other Fees & Charges

Fee for Late Registration or Late Payment	\$10.00-20.00
All students, regardless of classification, must clear fees and tuition by the deadline set by the University, or pay the following additional charges which are not refundable:	
Through official schedule adjustment period.	10.00
Effective with beginning of classes	20.00
Achievement Certificate Fee	10.00
Application Fee	15.00
The application fee must accompany all application for admission. Not refundable nor applicable to registration fees. (See section on Admissions.) An application fee must accompany the application for housing and is not refundable or applicable to housing fees. (See section on housing)	
	10.00
Auditing Fee (per course)	19.00
Any student who pays less than full fees must pay this fee for auditing a course. (Not charged to faculty and staff.)	
Change in Course fee	\$10.00
Charge is made in cases where student is not required or advised by the University to change, but has the Dean's permission to do so after Schedule Adjustment period.	
Change in Curriculum Fee (if change made after classes begin)	10.00
Chemistry Lab Fee (not refundable after 12th class day)	20.00
Correspondence Study Course Fees	
Registration Fee	10.00
Additional fee per credit hour	19.00
Duplicate Diploma Fee	15.00
Doctoral Dissertation Microfilming Fee	35.00
Equivalency Examination Fee (GED) (each)	15.00
Field Laboratory Program—Off Campus Courses	
Registration Fee	15.00
Additional fee per credit hour	19.00
Graduate Thesis and Dissertation Binding Fee (per copy)	7.00
Three to five copies usually required.	
Graduation Fee	15.00
Payable at beginning of the quarter in which the student expects to receive a degree. Deadline—two weeks before Graduation (transferable to next quarter or refundable if student fails to qualify).	
Cap and Gown Rental Fees (for Graduation Exercises)	
(includes retaining of tassel)	
Bachelors—cap and gown	5.95
Masters—cap, gown, and hood	11.95
Doctorate—cap, gown, and hood	11.95

Criminal Justice LE 464

Journalism Internship JM 425

Political Science Internship PO 450**Speech Communication 539, SC 658, SC 668**

Fees will be one-half the full University Fee and one-half the non-Alabama student fee if applicable. Total course load not to exceed 9 credit hours.

Music Fees**40.00**

This additional fee to be paid at the time of registering for each Performance Course of individual instruction. Instruction is available in one hour or two half-hour lessons per week.

Rent for Single Student Housing, per quarter**150.00 to 360.00****Rent for Married Students Housing, per month****135.00 to 200.00****Meal Plans (See section on Food Services under Student Services and Programs.)****Quarterly meal plans range up to (plus tax)****411.60****ROTC Uniform and Equipment Deposit (Air Force)****40.00**

All students, both Basic and Advanced, are required to deposit the sum of \$40 with the University Bursar, prior to enrollment in ROTC, except for Army and Naval ROTC. The deposit, less \$2.00 per quarter for ROTC activities is refunded to the student on completion of the program or withdrawal therefrom and the return of the uniform and other supplies.

Service and Penalty Charges**Registration fees billed home,****To parents, to Trust Funds, to companies, or other sponsors****5.00****Charge for returned check****5.00**

Failure to pay fees due or to make returned check good on notice where two or more notices are required

10.00 or 20.00

Notice: **CHECKS ARE ACCEPTED SUBJECT TO COLLECTION**

Special Service Fees

Cooperative Education Program

15.00

Internship Fee-Veterinary Medicine

15.00**Transcript Fee****3.00****Registration Fee Cancellations or Refunds**

If the student who has paid fees before the opening of the quarter officially resigns *prior* to the beginning of the quarter, all fees except late fees will be refunded. If the student resigns within the first 12 days of classes, all fees less charges will be refunded except the sum of \$60 for handling. Also if the student has used the University Health Service during that quarter, the \$15 Health Services Fee will be retained. No refunds will be made in case of withdrawals after 12 days of classes except in cases of resignation caused by personal illness (physician's statement required) or call into military service (copy of activation orders required). Students suspended for disciplinary reasons are not eligible for refund or cancellation of accounts due.

If student received student aid in the form of a scholarship, grant, or loan, any refunds due would be applied back to the student aid fund.

Academic Regulations

Registration and Scheduling

Every student who makes use of the instructional staff and facilities of the University must register and pay fees. This rule also applies to students who are clearing incomplete grades, clearing for graduation, or working on graduate thesis. The University Calendar on pages 6 and 7 lists the dates for registration, schedule adjustment and distribution, fee payment, and final registration. The student's dean authorizes and approves the subjects for which the student registers, as well as any changes or adjustments in his schedule. Courses should be scheduled in sequence as they appear in the curriculum model.

The student is urged to register during the computer-assisted registration held in the quarter preceding the term for which he is registering. A currently enrolled undergraduate who fails to do so is charged a late fee. Fall Quarter schedule distribution and fee payment are accomplished by mail in September. A final registration is held one to two days before the first day of classes.

When registering, the student is responsible for observing the prerequisites or corequisites of courses. Any waiver of these requirements must be approved by the instructor and/or his department head. Also, waiver of the junior standing prerequisite for courses that may be taken for graduate credit must have the Graduate School dean's approval.

Late registration must be authorized by the student's dean, and a late fee will be charged. A student's class load may be reduced by his dean. No student will be registered after the tenth day of classes without the approval of the Vice President for Academic Affairs.

Course credit completed at another college or university while the student is concurrently enrolled at Auburn University will not be counted toward his degree without prior permission from his dean.

Registration and Readmission Permits

Entering freshmen and first-quarter transfer students obtain permits to register from the Admissions Office. Previously enrolled undergraduates secure their permits from the Office of the Registrar; graduate students receive theirs from the Graduate School.

A student seeking readmission who has attended another college since he was enrolled at Auburn University must (1) be eligible to re-enter the last institution attended and (2) have a C average overall on course work attempted at other colleges attended two or more terms. Two official transcripts from each institution attended must be furnished to the Registrar's Office.

Change of Major or Curriculum

A student must have his dean's approval to change to another major within the same School. To change Schools within the University, a permit from the Registrar's Office is required.

Course Load

The maximum load for students in undergraduate curricula is 19 quarter hours. A normal load is 15-19 hours per quarter. With his dean's approval, a student may schedule less than a normal load.

The maximum load may be exceeded under the following circumstances:

1. The academic dean may approve up to 20 hours as a convenient load.

2. On approval of his dean, a student may schedule an overload not to exceed 23 hours if, during his last residence quarter at Auburn University in which he carried 15 or more hours, he passed all work attempted and earned a grade point average of 2.5 or higher. A student who has scheduled fewer than 15 hours during an intervening quarter (or quarters) will retain the overload privilege if all work carried was passed with a minimum grade-point average of 2.5 in each intervening quarter. In special cases the dean may make exceptions to the 2.5 requirement, by written notice to the Registrar.
3. On approval of his dean, a graduating senior who is ineligible to carry an overload may schedule a maximum of 23 hours if the overload will allow him to graduate in that quarter.

A student who registers for work in excess of his approved load may be required by his dean to drop the overload during the Schedule Adjustment period.

Curriculum Model Change

When the University changes a curriculum model, a student in the altered curriculum may be required to complete the subjects and hours placed above the level to which he has progressed. He will not, however, be required to complete additional subjects placed in the curriculum below the level he has achieved. Courses shifted from one class level to another are exempt from this latter provision. The student's dean will determine the revised subject requirements, and the Registrar will determine the revised total hour and grade-point requirements. In no case, however, will the changed curriculum compel a student to accumulate additional hours and grade points in order to graduate.

Classification

The undergraduate's classification will be determined by the number of credit hours he has earned at Auburn and elsewhere.

<i>Freshman</i>	47 or fewer quarter hours
<i>Sophomore</i>	48-95 quarter hours
<i>Junior</i>	96-143 quarter hours
<i>Senior</i>	144 or more quarter hours

The numbering sequence for identifying the classification of students is as follows:

1, Freshman; 2, Sophomore; 3, Junior; 4, Senior; 5, fifth year for Pharmacy, Architecture, and Veterinary Medicine; 10, Unclassified (non-degree students); 12, Special and Transient students and auditors only; 6, 7, 8, 9, 11, 13, and 14 are Graduate student classifications.

A student with a baccalaureate degree who undertakes a program for a second bachelor's degree will be classified as an undergraduate.

Auditing

Auditing of courses is restricted, and rarely permitted in laboratory courses. A student's audit privilege is granted only on the approval of the dean and the head of the department of the course involved.

Auditors not previously admitted to the University must be approved for registration by the Admissions Office. They must register and pay appropriate fees. Although listed on class rolls, auditors are not required to take part in classroom discussion, tests, examinations, or reports. They will receive no grade or credit; however, a student who does not attend or attend regularly the audited course will have "non-attendance" indicated by the course on his records.

A student may not change from audit to credit after classes begin, but he may change from credit to audit within the first three weeks of classes. No refund of fees will be made except for changes made during the first two weeks of classes in accordance with University policy.

Class Attendance

The University regards the final grade for a course as a measurement of the student's performance in achieving the objectives of the course. Absence from class sessions, in and of itself, should not determine, though it may well influence, the final grade in advanced courses. With respect, however, to 100-level and 200-level courses, the departments concerned may adopt such absence policies as they deem appropriate, and these shall be presented to each class, preferably in writing, at the beginning of the quarter.

The student shall be expected to carry out all assigned work, including laboratories, and to take all examinations at the class period designated by the instructor. Normally it is difficult to make up laboratories; therefore, the student must attend laboratory sessions during the times for which he is registered. Failure to carry out these assignments or to take examinations at the designated times will result in an appropriate reduction in grade, except as provided in the following paragraphs:

Each instructor shall determine the policy regarding assigned work which he feels is best for his course. In developing this policy the instructor shall consider carefully the nature of the course, the maturity level of the students enrolled in the course, and the consequent level of flexibility which his policy will include. The policy, along with the instructor's requirements for announced and unannounced examination attendance, shall be presented to the class, preferably in writing, at the beginning of the quarter and will govern the actions of the instructor in the course.

Instructors will be expected to recognize and honor official University excuses which may be issued to groups or individuals for absences due to participation in authorized University activities (athletic teams; events of a traditional nature such as the Hutsell Freshman Cake Race; or for absences directly related to the academic program such as authorized field trips*), and to make allowances for student absences caused by illness or personal emergencies. Absences from classes (with the exception of laboratories and classes which meet only once a week) between the hours of 3 and 6 p.m. on the day of the Wreck Tech parade and the Wilbur Hutsell ODK Freshman Cake Race will be excused for freshmen, members of the band, and cheerleaders. Arrangements to make up missed work shall be initiated by the student. Such arrangements could result in delayed due dates for assignments, or in IN or other deferred grades.

Excuses for student absences of a nonacademic, extracurricular nature will not be issued by the University but will be granted at the discretion of the individual instructor. Any evidence or request for consideration that the student may feel justifies his absence may be presented to the instructor for review.

Excuses for the purpose of attending reserve military training are normally denied.

The regularly accepted time for class procedure to begin shall be 10 minutes after the hour. If the instructor does not appear within 20 minutes after the hour, it may be assumed that the class is cancelled. All classes shall be dismissed promptly on the hour.

In order that the University may have effective class days, it is University policy that all classes will meet as scheduled the last day before holidays and the first day after holidays as designated by the University.

Unresolved problems may be referred to the office of the Vice President for Academic Affairs for resolution.

*Field trips will be authorized by the department and dean of the School in which the course is taught. The instructor will issue an official excuse to each student participating in the field trip. Any student may decline participation in a given field trip and receive an appropriate compensating assignment if, following consultation with his instructor, it appears that the field trip would adversely affect his other academic work.

Examinations

Examinations are classified as (1) final examinations at the end of each quarter; (2) special examinations; and (3) other course examinations as determined by the instructor. The final examination policy is stated below.

Announced tests in undergraduate courses will be administered at a regularly scheduled meeting of the course. Exceptions to this regulation may arise in specialized courses requiring performance or oral tests, and in multiple-sectioned laboratory classes requiring practical laboratory tests. Faculty having sound reasons for scheduling tests at times other than regularly scheduled meeting times are to obtain approval from the department head prior to the beginning of the quarter, and are to present a written schedule of these changes to the class during the first few days of the quarter. Rescheduled tests are not to interfere with other scheduled academic endeavors of the students involved, and an appropriate reduction in regularly scheduled class time is to be given to compensate for the rescheduled test period.

FINAL EXAMINATIONS. A final examination is a desirable means of evaluation in most undergraduate courses. In unusual circumstances, performance tests, term papers, research projects or other forms of evaluation appropriate to the objectives of the course may be substituted for a final examination with the approval of the department head, who will report his action to the dean and Vice President for Academic Affairs. Faculty not giving a final examination are to present to the class at the beginning of the quarter a written description of how final grades will be determined.

Final examinations should be administered during the hours specified in the quarterly examination schedule. Due to the specialized nature of many small upper-level undergraduate courses and graduate courses, deviations from this requirement are sometimes warranted. Such deviations are to be approved by the Vice President for Academic Affairs, and rescheduled examinations must not interfere with scheduled academic activities of the students involved. The professor teaching a 600-level course shall determine whether a formal final examination is appropriate.

Grades

Final passing grades are A, superior; B, good; C, acceptable; D, passing; and S, satisfactory. Final failing grades are F, failure; FA, failure for excessive absences; XF, absent from final examination and failing at the time; U, unsatisfactory; and WF, officially dropped with permission of the student's dean but failing at time of withdrawal.

A NG, no grade, thesis and dissertation research credit, is assigned to courses 699 Research for Thesis and 799 Research for Dissertation.

An X is assigned if the student is passing but missed the final examination, or if he has incomplete work and is absent from the final examination. An IN is assigned if the student has cleared the final examination but has not completed other required work. Grades of X and IN must be cleared during the student's next residence quarter or they will be recorded as permanent failing grades.

The first four days of each quarter are designated as the Special Examination period to remove X grades. The student will get a permit from his dean in order to make up a missed examination. A grade of IN will be changed by the Registrar upon written notice from the instructor. A final grade may be changed only by the written request of the instructor, with the approval of his department head and dean which must be submitted to the Registrar.

A grade of F and additional penalties may be assigned for academic dishonesty. See the Student Academic Honesty Code section in the *Tiger Cub* for further information.

GRADE ASSIGNMENT FOR CLASS WITHDRAWALS. No grade penalty shall be assigned for dropping a course on or before the fifteenth day of the quarter. (For courses with

fewer than five meetings per week, 15 class days should not be confused with 15 class meetings.)

A student who withdraws from a course prior to the first 10 days will have no grade assignment; however, after the first 10 days but prior to the first 16 days a W (passing) grade will be recorded for the course.

If a course is dropped after the first 15 days, but by the date of mid-quarter, the instructor shall assign a grade of W (passing) or WF (failing) as the case may be. A course can be dropped with a W after mid-quarter only under unusual conditions. When approval for dropping the course under such circumstances is granted by the student's dean, a W may be assigned only when the instructor indicates that the student is clearly passing the course. Otherwise, a grade of WF is assigned.

GRADE AVERAGE AND QUALITY POINTS. Effective Fall Quarter 1979 a 4.00 grade scale will be used. An A equals 4.00; B, 3.00; C, 2.00; D, 1.00; and F equals 0.00. Only course work attempted at Auburn University is used in determining the grade report average and continuation-in-residence requirements. S and U grades do not enter into grade-point computations.

S-U GRADING. Grades of S (Satisfactory) and U (Unsatisfactory) may be assigned only to courses approved to be graded S-U, and courses elected under the S-U option.

A junior or senior with a minimum overall grade average of 2.5 on at least 30 hours of credit earned at Auburn may elect any course to be graded on the S-U option, except for courses required in the freshman and sophomore years or for courses constituting the major as defined by the student's curriculum. A total of 20 credits may be earned at the rate of one course per quarter. The student will receive credit toward his degree for these courses, provided credit is normally accepted in his curriculum for this course work.

An unclassified student may schedule one or more courses on the S-U option with the approval of his dean. Course work completed on the S-U choice by unclassified students may not be applied later to degree requirements should the student become a degree candidate.

A graduate student may enroll in undergraduate courses, except for 400-level courses taken for graduate credit, under the S-U option on his major professor's recommendation.

Students are not permitted to change from S-U grading to conventional grading or vice versa after the schedule adjustment period.

GRADE REPORTS. In compliance with the Family Rights & Privacy Act (Buckley Amendment) of PL 93-380 (Educational Amendments of 1974) one copy of each student's grade report is mailed at the end of each quarter to the student at the address furnished by the student.

Dean's List

The name of every eligible student who meets certain scholastic requirements for a given quarter is placed on a list prepared for the dean of his School. This honor is also noted in the student's permanent record.

To meet Auburn University's requirements for inclusion on the dean's list, the student must be enrolled for 15 or more credit hours exclusive of any S-U option courses, pass all courses attempted for the quarter, and earn a grade-point average of at least 3.40 (on the 4.00 system). Furthermore, the dean of each School has established specific criteria governing inclusion on the list. The special requirements, applied in addition to the University regulations, are listed as follows:

School of Agriculture: 3.70 average.

School of Architecture and Fine Arts: a grade-point average within the upper 10 per cent of the full-time students enrolled in a given department.

School of Arts and Sciences: 3.75 average.

School of Business: 3.80 average.

School of Education: 3.80 average.

School of Engineering: 3.70 average; only if an S-U graded course is required in the student's curriculum may it be included in the 15-hour minimum total.

School of Home Economics: 3.80 average.

School of Nursing: 3.60 average.

School of Pharmacy: 3.75; only if an S-U graded course is required in the student's curriculum may it be included in the 15-hour minimum total.

School of Veterinary Medicine: grades in the upper five per cent of the enrollment of each class.

Interdepartmental-Environmental Health: 3.65 average.

Resignation

A student who wishes to resign from all course work for a quarter should contact his dean. He withdraws without penalty of failure if he resigns no later than mid-quarter, a date specified in the University calendar.

After this date, the dean will obtain from the student's instructors his scholastic standing at the time of resignation, and report it to the Registrar. If the student is failing in over half his work, the number of hours reported as failing will be counted as credit hours attempted and will be included in academic eligibility calculations. Those hours reported as passing will be dropped and will not be counted in the grade-point computation. Furthermore, when a student's total hours attempted, multiplied by two, exceed grade points earned by more than 45 at the end of his last quarter in residence prior to resignation, his grades will be reviewed by his dean to determine whether he has a C average for the quarter in which he is withdrawing. If the student does not have a C average, he will be placed on academic suspension.

When a student through illness or physical disability is forced to resign after mid-quarter, and when this condition has been the main factor in causing scholastic deficiencies, discretionary power in waiving the scholastic penalty will rest with the student's dean. A student who is resigned for disciplinary reasons will retain the academic status he achieved immediately prior to the disciplinary action.

Academic Probation and Suspension of Undergraduates

Auburn University may place an undergraduate student on probation or suspension at any time if he flagrantly neglects his academic work or makes unsatisfactory progress toward graduation.

Academic eligibility requirements for continuation in residence are calculated on Auburn University course work. Academic probation is a scholastic warning, indicating that the student is in danger of being suspended. A student on probation can continue his enrollment without interruption. Academic suspension is a status that bars a student from continued enrollment at the University for a period of time.

A student will be placed on academic probation whenever his total number of hours attempted at Auburn, multiplied by two, exceed grade points earned by more than 25 except that no entering freshman will be placed on probation on the basis of his first quarter's work at the University.

A student may remove his probation status by reducing his grade point deficiency to 25 or fewer grade points.

An individual on academic probation will be placed on suspension when the number of hours he has attempted at the University, multiplied by two, exceed grade points

earned by more than 45. However a student will not be suspended at the end of a quarter in which he earns a 2.0 (C) average, but will be continued on probation.

A student's first academic suspension will be for a period of two quarters, summer quarter being counted as any other quarter. He will be readmitted on academic probation following the expiration of his first suspension. A student who incurs a second academic suspension is placed on indefinite suspension for at least four quarters before his application for readmission will be considered.

An academically suspended student who has incomplete or other deferred grades which could, when cleared, remove his suspension will be permitted to register conditionally for the next quarter. The suspension must be removed within two weeks of the beginning of the quarter; otherwise he will be resigned by the Registrar's Office.

No credit earned at another institution by a student on academic suspension from Auburn will be used in clearing a suspension or in meeting requirements for an Auburn University degree.

A student who resigns after mid-quarter may be subject to academic suspension. (See Resignation on page 29 for further information.)

SCHOOL OF PHARMACY. A student enrolled in the School of Pharmacy who is placed on academic suspension and who wishes to re-enter the School must, in addition to complying with other University readmission requirements, be approved for readmission by the Pharmacy Admissions Committee and, when applicable, by the University Admissions Committee.

SCHOOL OF VETERINARY MEDICINE. Any student who earns less than a 2.25 grade-point average for any quarter will be placed on academic probation. A student who fails to earn a 2.25 grade-point average for any two quarters in the same academic or calendar year may be dropped from the School of Veterinary Medicine for scholastic deficiency. In addition, a student who does not have an overall average of 2.25 for an academic year or who does not have a veterinary overall average of 2.25 for an academic year or who does not have a veterinary school cumulative average of 2.25 at the end of any academic year may be required to withdraw from the School of Veterinary Medicine.

A student who makes a grade of F on any course may be dropped from the School of Veterinary Medicine until such time as the course is offered again. Such student may be required to repeat certain other courses in the curriculum for the quarter in which a grade of F was earned.

Students who are dropped under the above provisions are eligible for admission to other curricula provided they meet the general scholastic requirements for continuance in the University. Scholastic penalties incurred during enrollment in the School of Veterinary Medicine will become part of the student's record.

Advanced Standing and Credit

Entering freshmen with superior preparation may qualify for advanced placement and/or credit not to exceed a total of 45 quarter hours in the following areas: biology, botany, chemistry, English, foreign languages, history, mathematics, physics, and zoology.

Advanced placement or credit may be granted to entering freshmen who during their senior year in high school have made satisfactory scores on the College Board Advanced Placement Examinations. A student with special competence in a specific area, as evidenced by secondary school records and scores on college ability or achievement tests, may qualify for advanced placement or credit by scoring well on a departmental proficiency examination.

The amount of credit allowable through advanced placement is determined by the dean and the department head concerned.

Students transferring to Auburn University who have received advanced standing credits from another institution may be awarded advanced standing credit for examinations, advanced placement and CLEP tests, military service courses or experiences, and proficiency tests insofar as the University's requirements for awarding such credits are met and the credits are applicable to the student's curriculum.

The prospective student is advised to write to the Registrar's Office at Auburn University requesting a brochure on the Advanced Standing Program. This brochure details the advanced placement and credit programs, the College Level Examination Program (CLEP), the General and Subject examinations of the CLEP, and the minimum scores required on the tests.

DEPARTMENTAL PROFICIENCY EXAMINATIONS may be given by a department upon application of the student. He may apply for such a test if he has taken college-level work in secondary school, in class or on a tutorial basis, or through private study. If he earns a satisfactory grade on the subject examination he will be eligible for placement in an advanced course and for credit in the subject.

MILITARY SERVICE CREDIT. Students who have served in the Armed Forces may receive credit for military courses completed at the college level and correspondence courses completed through the Armed Forces Institute.

Those who have had military service may receive physical education credit as follows: for less than six months service, no credit; for six months to a year, one hour for Physical Education 101; for one year in service, two hours credit plus one hour's credit for swimming if the student passes the departmental swimming test.

Application for credit should be submitted to the Registrar. The student's dean must approve credits into the student's curriculum.

Correspondence and Extension Credit

A student may earn a maximum of 10 per cent of the total credits required for his baccalaureate degree by correspondence or extension; however only 18 hours of the final year's work may be earned thus. An individual having less than three quarters in residence prior to his last academic year may earn only 10 hours by correspondence or extension.

A student in residence may not enroll in a correspondence course if the course or a suitable substitute can be scheduled. The resident student may not exceed the maximum class hour load by adding a correspondence course.

The grade earned for correspondence credit will be entered on the student's record, but the grade points will not be included in the University grade average or continuation-in-residence requirements, nor will they exceed the credit hours earned equal to a C average.

Information on available courses may be obtained from the Correspondence Study Office, School of Education, Auburn University.

Degree Requirements

To earn the bachelor's degree a student must complete the subjects in his curriculum and must earn at least a C average on credits accepted for his degree program. An individual with credit from another institution must also have a C average on his Auburn course credits used in his curriculum toward graduation. A student in the School of Engineering must have a C average on all work attempted at Auburn. Credits required for graduation range from 196 to 257 hours.

The student's dean clears subject requirements in the curriculum; the Registrar clears total hour, grade point, freshman English, and physical education requirements.

Forty-five hours must be earned in residence in order to receive a bachelor's degree. As a general rule the 45 hours must be taken in the final year and in the school or curriculum of graduation. The student's dean may waive the final year's residence, and may also allow course credit to be earned at another institution during the final year. However the 45 hours in residence at Auburn is a firm requirement.

To complete a second baccalaureate degree, an Auburn graduate must complete an additional 45 hours, at least 90 grade points, 36 weeks in residence, and satisfy course requirements in the curriculum. A graduate of another four-year institution who seeks a bachelor's degree at Auburn must complete the hours required in the final year of his curriculum and satisfy the requirements listed immediately above.

Seniors must clear deferred grades by the tenth day of the graduation quarter for courses to be used toward degree requirements. Correspondence courses must be completed by mid-quarter prior to graduation.

A graduation fee is payable to the Cashier's Office, at the beginning of the quarter of graduation. If a student is in default on any payment due the University, his diploma and academic record will not be issued until the matter is cleared.

Degrees are conferred at Commencement exercises each quarter. If a student does not plan to attend the exercises, he should make arrangements with his dean or the Registrar to receive his degree *in absentia*.

Graduation Honors

Students with a minimum overall grade average of 3.4 are graduated *With Honor*; a 3.6 *With High Honor*; and a 3.8 *With Highest Honor*. This distinction of high academic achievement is placed on the student's diploma and on his permanent record.

The grade average for graduation honors must be achieved on Auburn University course work. A student with transfer credits must have the required grade average on all course work attempted elsewhere as well as on Auburn University courses. Grades of S or U and noncredit courses are not used in the calculations.

Students earning a second baccalaureate degree must earn the minimum overall grade average required for honor distinction on the additional hours completed for the second degree as well as on all course work attempted.

At least 45 hours and three quarters in residence at Auburn University are required for graduation honors.

Student Academic Grievance Policy

The Student Academic Grievance policy, which appears in full in the student handbook, *Tiger Cub*, is designed to resolve academic grievances of students which result from actions of faculty or administrators.

Confidentiality of Student Records

The University recognizes that the maintenance of student information and educational records is necessary and vital to assist the student's education and development and to provide opportunities for University research and policy formulation. The University recognizes its obligation to exercise discretion in recording and disseminating information about students to insure that student's rights of privacy are maintained.

The University will furnish annual notification to students of their right to inspect and review their educational records; the right to request amendment of educational records considered by them to be inaccurate or misleading or that violate privacy or other rights; and of their right to a hearing should the University decline to amend such records. This annual notice will be published in the University's Bulletin.

The following guidelines have been developed to insure the privacy rights of students. For the purposes of this policy statement a student is defined as an individual who has been admitted and has been in attendance in a component unit of the University. Classification as a student in one component unit of the University (e.g., an undergraduate program) does not infer that the person has been accorded the rights outlined below in other component units (i.e., graduate school, professional schools, branch campus).

Student Access to Records

Students have the right to be provided a list of the types of educational records maintained by the University which are directly related to the student; the right to inspect and review the contents of these records; the right to obtain copies of these records; the right to a response from the University to reasonable requests for explanation and interpretation of these records; the right to an opportunity for a hearing to challenge the content of these records; and if any material or document in the educational record of a student includes information on more than one student, the right to inspect and review only the part of such material or document as relates to the student.

Students do not have access to: financial records of their parents; confidential letters and statements of recommendation which were placed in the educational record prior to January 1, 1975, provided such letters or statements were solicited or designated as confidential and are not used for purposes other than those for which they were specifically intended; confidential recommendations, if the student signed a waiver of the right of access, respecting admission, application for employment, and the receipt of an honor or honorary recognition.

Students do not have access to: instructional, supervisory, and administrative personnel records which are not accessible or revealed to any other individual except a substitute; Campus Security records which are maintained apart from educational records, which are used solely for law enforcement purposes, and which are not disclosed to individuals other than law enforcement officials of the same jurisdiction; employment records except when such employment requires that the person be a student; and the Alumni Office records.

Students do not have access to physical or mental health records created by a physician, psychiatrist, psychologist or other recognized professional acting in his or her capacity or to records created in connection with the treatment of the student under these conditions which are not disclosed to anyone other than individuals providing treatment. These records may be reviewed by a physician or appropriate professional of the student's choice.

Procedures for Access

The Registrar's Office has a complete list of educational records maintained by the University which students may obtain. Students should contact the appropriate office to inspect and review their records. An office may require that a University official be present when a student inspects and reviews his educational records. Any questions concerning a student's access to records should be directed to the Registrar.

Release of Directory Information

"Directory Information" may be released by the University without the student's written consent. Directory information consists of all items listed on the student's registration card, participation in recognized activities and sports, weight and height of members of athletic teams, dates of attendance, degrees and awards received, the most recent previous educational agency or institution attended, and other similar information.

A student may deny the release of directory information by requesting that the information not be released. This should be done at registration time. The student who is in attendance must notify the Registrar's Office in writing each quarter of enrollment to deny the release of this information. To deny the release of participation in recognized activities the student must notify the Dean of Students and his Academic Dean in writing. To deny the release of athletic information the student must notify the Director of Athletics in writing. To deny the release of directory information a student must give the above notification each quarter of registration. A former student, one who is not in attendance, must contact the appropriate offices above to deny the release of directory information.

Release of Educational Records

The University will release a student's educational record(s) upon the student's written request. The student must:

1. Specify the records to be disclosed.
2. Include the purpose or purposes of the disclosure.
3. State the party or parties and the address to whom the information is to be disclosed.

The student shall, upon request, receive a copy of the record that is to be disclosed. It is University policy to furnish single copies of a student's record at no charge except for the standard transcript fee, if applicable.

The University may release students' educational records to the following without prior written consent:

1. University officials who have a legitimate educational interest in the records. University officials are defined as teachers, administrative personnel and other employees except personnel of the security or law enforcement unit of Auburn University who in the performance of their normal duties require access to student records. If University officials are required in the performance of their duties to review the educational records of a student, this will be considered to be a legitimate educational interest.
2. Officials of another school in which the student intends to enroll upon request of the transfer school.
3. Government representatives of the Comptroller General of the United States, the Secretary of Education, the U.S. Commissioner of Education, the Director of the National Institute of Education, the Assistant Secretary for Education, State educational authorities, and State officials to which such information is specifically required to be reported or disclosed by State law adopted prior to November 19, 1974.
4. Appropriate authorities in connection with financial aid with the understanding that only the necessary records will be released.
5. To organizations conducting studies for, or on behalf of, the University or its agencies for the purpose of developing, validating, or administering predictive tests, administering student aid programs, and improving instruction and student life provided that the studies will not permit the personal identification of students and their parents by individuals other than representatives of the organization and provided that the personally identifiable information furnished will be destroyed when no longer needed for the purposes for which the study was conducted.

6. To accrediting organizations to carry out their accrediting functions.
7. To parents of a dependent student as defined in section 152 of the Internal Revenue Code of 1954. University officials may release educational records to parents on the basis of a written certification from the parent that the student is a dependent as defined under the Code.
8. To comply with a judicial order or lawfully issued subpoena with the understanding that the student will be notified in advance insofar as possible.
9. To appropriate parties to protect the health and safety of the student or other individuals in emergencies with the understanding that only information essential to the emergency situation will be released, that information will only be released to a party who would be in a position to deal with the emergency, and that the student will be notified insofar as possible of the information released, the purpose for the release, and to whom the information was released.

No personal information on a student will be released without a statement from the University to the party receiving the information that no third party is to have access to such information without the written consent of the student.

Each office with educational records will maintain a record of each request and disclosure of personally identifiable information from the educational records of a student except for information requested in writing by the student, information released to the student or the student's parents, directory information, and information released to University officials and teachers who have a legitimate educational interest in the records. The student may inspect the record of requests, disclosures and the legitimate interests of parties requesting or obtaining information in the appropriate University office.

Amending Educational Records

A student may request that any information contained in his educational records which the student considers to be inaccurate, misleading, or in violation of his privacy or other rights be amended or deleted from the records. (A grade or other academic scores may not be amended, except that the accuracy of recording the information may be challenged.)

A student who requests that information in his records be amended should first direct his request to the official with primary responsibility for the information on the record. If the matter is not resolved to the student's satisfaction, the student should direct his request to the official's dean or division head. If the matter is not resolved to the student's satisfaction, he may request a formal hearing.

Right to a Formal Hearing and Procedures for Decision

A student may request a formal hearing to challenge information contained in his educational records. The hearing will be held in a reasonable time (not to exceed 45 days) and in a reasonable place. The student may be assisted or represented by a person of his choice, including an attorney, at the expense of the student, and shall be afforded a full and fair opportunity to present evidence relevant to the issue(s).

The student or his representative should request the hearing in writing and should specifically identify the information he seeks to have amended. The request should be directed to the Dean of Students.

The Dean of Students will conduct the hearing and render a decision within a reasonable period of time after the conclusion of the hearing and the decision shall be based solely upon the evidence presented at the hearing. The student shall be notified in writing of the reason(s) for the decision and a summary of the evidence.

If the decision is that the information in the student's educational records is inaccurate, misleading or in violation of his rights and privacy, the statement(s) will be corrected or expunged from the student's records.

If the decision is that the information is not inaccurate, misleading, or in violation of the privacy or other rights of the student and that the information or parts thereof is to remain in the student's educational records, the student shall be notified and given the right to enter a statement in his records setting forth any reason for disagreeing with the decision of the Dean of Students. This statement shall be maintained in the records as long as the record or contested portion thereof is maintained, and if the contested educational record or contested portion thereof is disclosed by Auburn University to any party, the student's explanation shall also be disclosed to that party.

The Secretary of Education has established a review board to receive complaints regarding violation of students' rights. Students wishing to file a complaint directly to the review board should write to the Family Educational Rights and Privacy Act Office, Department of Education, 330 Independence Avenue, SW, Washington, D.C. 20201. Detailed procedures for this complaint procedure are listed under section 99.63 of the regulations issued by the Secretary and will be furnished upon request by the Registrar, Auburn University.

This policy is adopted pursuant to the Family Educational Rights and Privacy Act of 1974, as amended (20U.S.C. §1232g), and is not intended to impose any restrictions or grant any rights not specifically required by this Act.

Housing

Auburn University offers a variety of on-campus housing accommodations for students. There are 25 residence halls, 138 apartments for single students, and 384 apartments for married students. All are convenient to classrooms, cafeterias, washaterias, mail rooms and recreational areas.

Single Students

Apartments for single students are located in Caroline Draughton Village. The residence halls, with the exception of Alumni Hall which is located on S. College Street, are clustered in three areas on the campus.

The Magnolia Complex consists of:

*Alumni Hall
Bullard Hall
Magnolia Hall
Noble Hall*

The Quadrangle Complex consists of:

- | | |
|----------------------------------|------------------------------------|
| <i>I Elizabeth Harper Hall</i> | <i>VII Mary Lane Hall</i> |
| <i>II Kate Conway Broun Hall</i> | <i>VIII Ella Lupton Hall</i> |
| <i>III Willie Little Hall</i> | <i>IX Helen Keller Hall</i> |
| <i>IV Kate Teague Hall</i> | <i>X Marie Bankhead Owen Hall</i> |
| <i>V Letitia Dowdell Hall</i> | <i>XII Dana King Gatchell Hall</i> |
| <i>VI Allie Glenn Hall</i> | |

The Hill Complex consists of:

A Mollie Hollifield Hall
B Annie Smith Duncan Hall
C Marquerite Toomer Hall
D Zoe Dobbs Hall
E Berta Dunn Hall

F Dixie Bibb Graves Hall
G Camille Early Dowell Hall
H Stella White Knapp Hall
J Mary Boyd Hall
K Sara Sasnett Hall

Students contract with the University for a particular TYPE of accommodation. Single student housing includes the following types of living accommodations:

TYPE I

Two bedroom (four students) apartments furnished; air-conditioned; TV cable, private telephone, carpeted; all utilities included; rent, \$360 per student per quarter. (Caroline Draughon Village Extension, Buildings A-F).

TYPE II

Suites consisting of two double rooms with connecting bath; private telephone; air-conditioned; rent, \$250 per student per quarter. (Hill dorms A-K, Quad dorms 1,2,3,4,7 & 8).

TYPE III

Suites consisting of two double rooms with connecting bath; private telephone; non-air-conditioned; rent, \$220 per student per quarter. (Quad dorms 5,6,9, & 10).

TYPE IV

Double rooms with community baths on each floor; air-conditioned with private telephone; rent, \$210 per student per quarter. (Magnolia & Noble Halls).

TYPE V

Double rooms with community baths on each floor; non-air-conditioned with private telephone; rent, \$170 per student per quarter. (Quad dorm 12 & Alumni Hall).

TYPE VI

Double rooms with community baths on each floor; non-air-conditioned without private telephone; rent, \$150 per student per quarter. (Bullard Hall).

The prices listed above are effective Fall Quarter and are subject to change. Any rate increase will be announced prior to the cancellation date for the quarter the Agreement is to begin.

Specially equipped facilities for handicapped students are provided in four campus residence halls and fourteen apartments. These facilities include wheelchair ramps, specially designed bathrooms, and modified furnishings.

Each residence hall is staffed with a Head Resident or Graduate Resident Adviser who serves as a counselor to the students. Students' rooms are furnished with single beds, study desks, mirrors, chest of drawers, chairs, book shelves, and closets. Residents may bring other furnishings including study lamps, bedspreads and linens, curtains or drapes, rugs or carpet, extra book shelves, radios, stereos, television sets, plants, posters, and small refrigerators. Students are encouraged to bring room fans for non-air-conditioned halls, but room air-conditioners are not allowed. Most of the residence halls are equipped with telephones; if not, there is a phone on each hallway. All residence halls have kitchens for use by the occupants and lounges for entertaining or watching television.

The apartment complex for single students is located on Roosevelt Drive in Caroline Draughon Village. The apartments are within walking distance of all classroom buildings and recreation and sports facilities. These two-bedroom apartments accommodate four students. Each apartment has an all-electric kitchen and features modern furnishings, carpeting, and venetian blinds. Students should bring their own linens, dishes, utensils, and other items to personalize their apartments. Local telephone service, TV cable, and all utilities are included in the rent. Parking areas are adjacent to the apartments. Laundry facilities, a delicatessen/snack area, and a study lounge are in the complex.

Married Students

Apartments for married students, and single graduate students on a limited basis, are located in Caroline Draughon Village. These apartments are grouped in two-story brick buildings of 8, 16, and 20 units. Each apartment has a separate outside entrance. The apartments feature all-electric kitchens, furnished living and dining rooms and bedrooms, spacious closets, ample cabinets and baths with shower-tub combinations. A limited number of unfurnished apartments is available. Monthly rent includes heat, water, solid waste disposal, sewage, garbage pickup and TV cable. Electricity and telephone charges are the responsibility of the resident.

There are 224 two-bedroom and 160 one-bedroom apartments for married students. These units include the following types of living accommodations.

TYPE A

Two bedroom apartments; central air-conditioned; rent per month: \$200 furnished, \$195 unfurnished.

TYPE B

Two bedroom apartments; 18,000 BTU air-conditioner in master bedroom; rent per month: \$175 furnished, \$170 unfurnished.

TYPE C

Two bedroom apartments; non-air-conditioned; rent per month: \$165 furnished, \$160 unfurnished.

TYPE D

One bedroom apartments; 18,000 BTU air-conditioner in master bedroom; rent per month: \$150 furnished, \$145 unfurnished.

TYPE E

One bedroom apartments; non-air-conditioned; rent per month: \$140 furnished, \$135 unfurnished.

The prices listed above are effective Fall Quarter and are subject to change. Any rate increase will be announced prior to the cancellation date for the quarter the lease is to begin.

A RESERVATION IN UNIVERSITY HOUSING IS NOT VALID UNLESS THE APPLICANT HAS BEEN ADMITTED TO AUBURN UNIVERSITY.

Admission to Auburn University does not automatically include a space in University housing. It is the responsibility of the student to make housing arrangements either on or off campus. Housing information is sent to entering students with their provisional acceptance to the university. Other requests for housing should be addressed to the Housing Office, Burton Hall.

Students may apply for any number of quarters within the Summer-Fall-Winter-Spring contract period by submitting a Housing Application with a \$10.00 (non-refundable) processing fee. Priority for housing is based upon the date the application, with processing fee, is received and the number of quarters applied for. Students entering University housing summer quarter have priority over those entering University housing fall quarter.

The Housing Agreement (Lease for married students), when offered, will be for a specific TYPE living accommodation. In order to reserve a space in single student housing, the Housing Agreement must be returned to the Housing Office promptly with a \$100.00 check for the housing deposit. In order to reserve an apartment in married student housing, the Lease must be returned to the Housing Office with a rental prepayment. The deposit for married student housing is required prior to the Lease offering. Deposits and prepayments must be made by check payable to Auburn University and received at the Housing Office, Burton Hall, Auburn University, Alabama.

The deposit is a combination room reservation/damage/room clearance deposit and is not applicable to rental payment, except on cancellation as provided within the Housing Agreement or Lease. The Housing Agreement and Lease outline conditions under which refunds may be made.

Single student housing officially opens for occupancy on the day preceding registration and schedule adjustment for each quarter. Single student housing closes and must be vacated on the morning following graduation. Married student housing opens and closes corresponding to the duration of the Lease.

Quarterly rental payment for single student housing is due and must be received at the Housing Cashier office by 4:45 p.m. on the applicable payment due date as follows: Summer—May 1; Fall—July 1; Winter—December 1; Spring—March 1. When full payment is not received by the payment due date, the University may cancel the Agreement or accept late payment, assessing the student a late payment fee of \$10.00 for each seven day period between the due date and receipt of full payment. Refer to the Housing Agreement for other collection remedies.

Monthly rental payment for married student housing is due on the first day of each month. When full payment is not received on or before the tenth calendar day of the month, the lessee shall be assessed a \$10.00 late fee. Refer to the Housing Lease for other collection remedies.

Off-Campus Housing

Privately-owned dormitories, fraternities, apartments, houses, and mobile homes in the Auburn community also provide living quarters. The University maintains a current file of available accommodations in the Housing Office, Burton Hall.

The University neither inspects nor approves off-campus housing. The facilities must, however, conform to federal regulations and to the local code of health and safety regulations.

Food Services

Auburn University Food Services is a non-profit organization supported entirely by food sales in the various food services operations located on campus. All services offered to students are strictly on a voluntary basis and are available to students living both on and off campus. Food Services offers a variety of meal services to meet the needs of students, as well as faculty, staff, and visitors to the Auburn Campus.

The Chef's Club

Students have the opportunity to become a member of the Chef's Club, an Auburn University Food Services charge plan. As a member of the Chef's Club, students have the privilege of their own charge account and the convenience of charging their meals in any of the six food service operations located on campus. There is a membership fee of \$5.00 per quarter to be paid as follows:

Members joining summer quarter - \$20 fee - card valid through spring quarter

Members joining fall quarter - \$15 fee - card valid through spring quarter

Members joining winter quarter - \$10 fee - card valid through spring quarter

Members joining spring quarter - \$5 fee - card valid that quarter only

If a student graduates or leaves school, the membership fee will be reimbursed for each complete unused quarter.

Students may receive credit approval by furnishing a parent's notarized signature as co-signer or by furnishing two credit references. Chef's Club charges are billed on a monthly basis and the total amount must be paid within ten days after the mailing. All Chef's Club bills must be paid before a student can register for the next quarter.

For many of the Chef's Club card holders, this is the first time they have experienced having their own charge account. We want the members to enjoy this new found freedom and privilege, but we also like to remind them that charges can accumulate rapidly and all charges must be paid. With a little common sense and discretion, having their first charge account can be both a fun and educational experience.

Meal Plans

Some students prefer to purchase a meal plan in order to take advantage of a lower cost per meal. Students on a meal plan have unlimited seconds on all food items except entrees and milk. Meal plans are only offered in Bullard Cafeteria. The types of meal plans offered are as follows:

7 Day: Monday thru Sunday noon (20 meals per week)	\$392.00 tax 19.60 <hr/>
	\$411.60
5 Day: Monday thru Friday noon (14 meals per week)	\$325.00 tax 16.25 <hr/>
	\$341.25
Quarter 99: Any 99 meals during the quarter	\$294.00 tax 14.70 <hr/>
	\$308.70

Cash

Cash is accepted at all food operations located on campus. However, an advantage of a Chef's Club card or meal plan is that the student does not have to worry about carrying cash at all times during the quarter.

Additional information about the Chef's Club and meal plans may be obtained from the offices of both Food Services and the Chef's Club.

Student Health Center

The Health Center is designed to care for students with acute illnesses and injuries that occur while they are in school, the monitoring of students who have chronic problems and treatment or referral of exacerbation of chronic problems. The objective is to help students function at their optimal level and to prepare them for life after school.

The Health Service supplements the student's own medical program rather than providing comprehensive medical care. It is strongly recommended that individual health insurance be carried to cover major medical or surgical services.

HOURS OF OPERATION

DURING QUARTER SESSION

The out-patient clinic is open from 8:00 a.m. to 12:00 noon and 1:00 p.m. to 4:00 p.m. each day, Monday through Friday, and 9:00 a.m. to 12:00 noon on Saturdays. Emergency treatment is available during all other hours, seven days per week, with a staff physician on call.

HOLIDAYS

The Health Center is closed from 4:30 p.m. on the day preceding an official University holiday until 7:00 a.m. on the day following the holiday.

BETWEEN QUARTERS

Starting at 8:00 a.m. on the day after graduation until the day before classes start the next quarter, only out-patient treatment will be provided. The hours of operation will be 8:00 a.m. to 12:00 noon and 1:00 p.m. to 4:00 p.m., Monday through Friday. Limited service is available for students registered in the next quarter. For service available to those students participating in University-sponsored functions special arrangements are to be made.

Financial Aid

The Office of Student Financial Aid at Auburn University provides financial assistance to students who need aid in order to attend the University. The University believes that the amount of aid granted should be based on financial need. To determine need, Auburn uses the ACT Need Analysis System of the American College Testing Program. Students seeking assistance are required to submit the Family Financial Statement to the ACT Program annually. Applications for aid should be completed in January or February of the year prior to the academic year in which the student will need assistance. Application materials and a brochure describing available aid programs may be obtained from the Office of Student Financial Aid, 214 Mary Martin Hall.

The financial aid for which students may apply includes scholarships, grants, loans and part-time employment.

Scholarships may be awarded to undergraduates with financial need who have shown high academic attainment and promise. *Basic Educational Opportunity Grants* and *Alabama Student Assistance Program Grants* are provided to undergraduate students who can demonstrate need. *Supplemental Educational Opportunity Grants* are available, in limited number, to undergraduates with financial need.

National Direct Student Loans and *Institutional Loans* provide long-term, low interest loans to students who can demonstrate need. Long-term *Federal-State Guaranteed Loans* may be obtained from commercial lending institutions.

The *College Work-Study Program* provides part-time employment for students who demonstrate financial need. The *Health Professions Loan Program* makes available long-term loans for students in Pharmacy and Veterinary Medicine. The *Law Enforcement Education Program* provides loans or grants to full-time law enforcement officers.

Graduate students may be eligible for teaching and research assistantships and traineeships. Information is available from the head of the department of the student's major field.

Employment

Students seeking part-time employment while attending the University should contact the Student Employment Service. As a referral agency, the service assists students in finding employment on campus as well as maintaining bulletin boards with notices of job openings with businesses and industries in the local area. Applicants for employment are referred to prospective employers on the basis of the date of application and the skills of the applicant.

Auburn University employs in excess of 1,800 students on an hourly basis. Students may work a maximum of 30 hours per week while enrolled for six or more quarter hours. The number of hours set by off-campus employers may vary but usually range from 10 to 30 hours per week.

Applications and additional information may be obtained from the Student Employment Service, 312 Mary Martin Hall.

Career Development Services

Counselors provide confidential assistance to students with curriculum selection, career exploration, personal concerns, learning skills development, and legal matters. Also included are advisory services to married and international students. A Study Partners program is offered quarterly. Testing services offers CLEP (College Level Examination Program) examinations as well as intelligence tests, personality assessments, interest inventories and aptitude tests.

The Placement Service assists, without charge, students and alumni in securing business and professional positions through its contacts with potential employers. Representatives of firms and agencies visit the campus each quarter for personal interviews with students. Seniors and graduate students who desire information and assistance should confer with the Coordinator of Placement, 400 Martin Hall.

For information on employment while in University residence, see the section on Financial Aid, page 41.

Student Government Association

Upon enrollment at Auburn University, each student becomes a member of the Student Government Association, the official organization of the student body. All students are urged to participate in the Association or SGA, as it is called, and to become involved in the political life of the campus.

SGA is organized into executive, legislative, and judicial branches. Each of the 11 Schools of the University is represented in the Student Senate. One of that body's powers is the selection of a non-voting student representative to attend meetings of Auburn University's Board of Trustees. The judiciary is made up of a presiding justice and six associates. Officers and senators are chosen in the Spring Quarter by general election. The Student Government Constitution and Laws, published in the *Tiger Cub*, detail the functioning of student government.

Student Communications

The following media, supported by Student Activity fees, are subject to supervision by the Board of Student Communications:

The Auburn Circle, a quarterly literary magazine
The Glomerata, the yearbook issued each spring
The Auburn Plainsman, the weekly student newspaper
The Tiger Cub, annual student handbook
WEGL-FM, the student operated campus radio station

Other publications include the *Auburn Design*, a booklet published yearly for and by students in Industrial Design; the *Auburn Veterinarian*, a quarterly published by and for students in Veterinary Medicine; and the *Auburn Pharmacist*, issued once a quarter by the School of Pharmacy. The latter three do not derive support from the Student Activity fee.

The Foy Union

The Foy Union serves as a focal point for co-curricular student activities as well as other campus programs. The Union houses the *Plainsman*, *Glomerata*, *Auburn Circle*, Alpha Phi Omega Bookstore, SGA, IFC, Panhellenic Council, University Program Council, Alumni Association, War Eagle Cafeteria, a recreation room, a typing room, a ceramics room, woodworking hobby shop, and an art gallery. It also provides lockers for commuters, a 24-hour banking service, several lounge areas and an assortment of meeting and banquet rooms. In addition, a University-wide information center and calendar of events is maintained.

The University Program Council

The University Program Council serves as a clearing house for campus programs as well as providing a wide range of programs and entertainment through the following committees: Fine Arts, Major Entertainment, Horizons, Publicity, Special Events, Outdoor Recreation, Indoor Recreation, and Films. The experience students acquire in planning and executing these programs offers them the opportunity to enhance their personal growth and development.

The University Chapel

The University Chapel, located on the corner of South College Street and Thach Avenue, is open on weekdays for students, faculty, and staff. It is used for prayer and meditation and can be reserved for religious and certain other University events at nominal or no cost with the Union Director. The use of the organ is supervised by the Department of Music.

ORGANIZATIONS

The student handbook, *Tiger Cub*, available in the office of the Dean of Students, has a complete listing of the more than 300 chartered and officially recognized organizations on the Auburn campus. Most of these organizations are open to any interested student.

Among the national organizations on campus there are honor societies, national recognition societies, social sororities and social fraternities. They are:

National Honor Societies

The following members of the Association of College Honor Societies have established chapters at Auburn:

Alpha Epsilon (Agricultural Engineering)
Alpha Epsilon Delta (Pre-Medicine)
Alpha Kappa Delta (Sociology)
Alpha Lambda Delta (Freshman Scholarship)
Alpha Pi Mu (Industrial Engineering)
Alpha Sigma Mu (Metallurgical & Materials Engineering)
Chi Epsilon (Civil Engineering)
Delta Sigma Rho-Tau Kappa Alpha (Forensics)
Eta Kappa Nu (Electrical Engineering)
Kappa Delta Pi (Education)
Mortar Board (Student Leadership)
Omega Chi Epsilon (Chemical Engineering)
Omicron Delta Kappa (Student Leadership)
Omicron Nu (Home Economics)
Phi Alpha Theta (History)

Phi Eta Sigma (Freshman Scholarship)
Phi Kappa Phi (Senior Scholarship)
Pi Delta Phi (French)
Pi Sigma Alpha (Political Science)
Pi Tau Sigma (Mechanical Engineering)
Psi Chi (Psychology)
Rho Chi (Pharmacy)
Sigma Delta Pi (Spanish)
Sigma Gamma Tau (Aerospace Engineering)
Sigma Pi Sigma (Physics)
Sigma Tau Delta (English)
Tau Beta Pi (Engineering)
Tau Sigma Delta (Architecture & Allied Arts)
Xi Sigma Pi (Forestry)

National Recognition Societies

The following national societies have chapters established at Auburn:

Alpha Epsilon Rho (Broadcasting)
Alpha Eta Rho (Aviation)
Alpha Phi Omega (Service)
Alpha Tau Alpha (Agricultural Education)
Alpha Zeta (Agriculture)
Angel Flight (Air Force ROTC Auxiliary)
Arnold Air Society (Air Force ROTC)
Beta Alpha Psi (Accounting)
Beta Gamma Sigma (Business)
Block and Bridle (Animal Husbandry)
Capers (Army ROTC Auxiliary)
Delta Omicron (Music)
Delta Sigma Pi (Commerce and Business Administration)
Disc and Diamonds (Army ROTC)
Gamma Sigma Delta (Agriculture)
Gamma Sigma Sigma (Service)
Kappa Epsilon (Pharmacy)
Kappa Psi (Pharmacy)
Lambda Sigma (Sophomore Leadership)
Lambda Tau (Medical Technology)

Omicron Delta Epsilon (Economics)
Omicron Kappa Pi (Architecture)
Pershing Rifles (Military)
Phi Chi Theta (Business Administration and Economics)
Phi Delta Kappa (Education)
Phi Delta Chi (Pharmacy)
Phi Lambda Sigma (Pharmacy)
Phi Lambda Upsilon (Chemistry)
Phi Mu Alpha (Music)
Phi Psi (Textiles)
Phi Zeta (Veterinary Medicine)
Pi Alpha Xi (Floriculture)
Pi Mu Epsilon (Mathematics)
Scabbard and Blade (Military)
Semper Fidelis (Marine Corps ROTC)
Sigma Delta Chi (Journalism)
Sigma Gamma Epsilon (Earth Sciences)
Sigma Lambda Chi (Building Construction)
Sigma Xi (scientific research)
Steerage (Navy ROTC)
Upsilon Pi Epsilon (computer science)

Sororities

Alpha Chi Omega
Alpha Delta Pi
Alpha Gamma Delta
Alpha Kappa Alpha
Alpha Omicron Pi
Alpha Xi Delta
Chi Omega
Delta Delta Delta
Delta Gamma

Delta Sigma Theta
Delta Zeta
Gamma Phi Beta
Kappa Alpha Theta
Kappa Delta
Kappa Kappa Gamma
Phi Mu
Pi Beta Phi
Zeta Tau Alpha

The Panhellenic Council coordinates the activities of its member groups.

Social Fraternities

Alpha Epsilon Pi
Alpha Gamma Rho
Alpha Psi (professional)
Alpha Tau Omega
Beta Theta Pi
Delta Chi
Delta Sigma Phi
Delta Tau Delta
FarmHouse
Kappa Alpha Order
Kappa Alpha Psi
Kappa Sigma
Lambda Chi Alpha
Omega Psi Phi
Omega Tau Sigma (professional)

Phi Beta Sigma
Phi Delta Theta
Phi Gamma Delta
Phi Kappa Psi
Pi Kappa Tau
Pi Kappa Alpha
Pi Kappa Phi
Sigma Alpha Epsilon
Sigma Chi
Sigma Nu
Sigma Phi Epsilon
Sigma Pi
Tau Kappa Epsilon
Theta Chi
Theta Xi

The Interfraternity Council coordinates the relationships among the member fraternities.

Intramural Sports and Recreational Services

The University offers a well rounded program of intramural athletics and provides a variety of facilities for recreation. Healthful sports, good sportsmanship, and friendly competition are stressed, and all students are urged to participate in recreational activities.

Regular tournaments are offered in seasonal team and individual sports. The intramural program operates services in the Student Activities Building where students may check out recreation equipment. For additional information, consult the Recreational and Intramural Sports handbook which can be obtained at the Intramural Office, 2074 Memorial Coliseum.

Student Insurance

The Student Government Association sponsors two Accident and Sickness Insurance Plans, which are available to all registered undergraduate and graduate students. The plans provide maximum coverage at minimum cost. Additional information on insurance is available in the Dean of Students Office, Cater Hall.

Discipline

Auburn University establishes and enforces only those rules and regulations for conduct as are needed to maintain the well-being of the individual student and the University community. The student, in registering at the University, agrees to conform with its regulations. He is subject to disciplinary action if he violates any section of the Code of Student Discipline, which appears in full in the student handbook, *Tiger Cub*. Enrollment in no way exempts any student from penalty in case of conviction by public authorities for commission of an illegal act.

Music, Theatre, and Lectures

Classical concerts, touring play productions, lectures by political figures, news commentators, specialists and prominent scholars, traveling and local shows at the art galleries, opera, ballet, and films are among the special events of the year at the University. Many of these activities are free.

The University Concert Choir, the Choral Union, University Singers, the Marching and Concert Bands, the University Orchestra and the Opera Workshop offer opportunities for those who want to perform in Musical groups.

Eight or nine productions each year are offered by the Auburn University Theatre. Students are welcome to audition for any production but priority in casting is given to theatre majors and minors.

The Auburn Dance Theatre gives students an opportunity to further their dance study and to perform in Winter and Spring concerts as well as in the academic and local communities. Choreography generally includes ballet, jazz, and modern dance styles. The Dance Theatre meets the first Tuesday of classes at 7 p.m. in 2093 Memorial Coliseum.

The Auburn Studio of the Alabama Public Television Network produces programs which are seen throughout the state on the Alabama Educational Television network. WEGL-FM is the campus radio station, operated by students.

Related Programs and Activities

Cooperative Education Program

The Cooperative Education program provides opportunities for students to alternate quarters of academic study with quarters of experience in industry, education, business, and government agencies.

Coordination of study and work combines theory and practice. As a consequence students find increased meaning in and motivation for their studies. This experience helps to develop a sense of responsibility, judgment, and maturity. Students also benefit financially, since they are paid for their work.

In all four-year curricula, the Cooperative Education Program is a five-year plan. A student must complete at least two quarters of the freshman year with an above average scholastic record before "being placed" with an employer. Cooperative Education is offered in all curricula of the Schools of Agriculture, Architecture and Fine Arts, Arts and Sciences, Business, Education, Engineering, and Home Economics.

Additional information may be secured from the Director, Cooperative Education, Auburn University.

Independent Study

The Independent Study program provides undergraduate and non-credit instruction for persons unable to attend college on a regular basis. The credit courses parallel those given in the University, award college credit, and are taught by faculty members.

The student, upon registration, receives a course outline and instructions. He will be expected to do textbook readings, submit written preparations, and do possible supplemental work. A final examination is given upon completion of unit work. Any person is eligible for enrollment, although such enrollment is not equivalent to admission to the University.

Although graduate credit cannot be earned by correspondence, certain undergraduate deficiencies may be cleared.

Fees for correspondence courses are listed under Fees and Charges. See also Off-Campus Credit in the section on Academic Regulations. Application forms and a course bulletin are available from the Independent Study Program, Office of Continuing Education, 100 Mell Hall, Auburn University, Alabama 36849.

Special Clinics

The Speech and Hearing Clinic of the Department of Speech Communication, primarily a teaching facility, provides service for students with speech, hearing or language problems. These services may involve both diagnoses and treatment of problems.

Bookstores

The University Bookstore, located in Haley Center, offers a full line of textbooks and other instructional materials. Alpha Phi Omega service fraternity sponsors a nonprofit bookstore in the Foy Union Building where students may purchase and sell textbooks. There are also commercial book outlets in the city of Auburn.

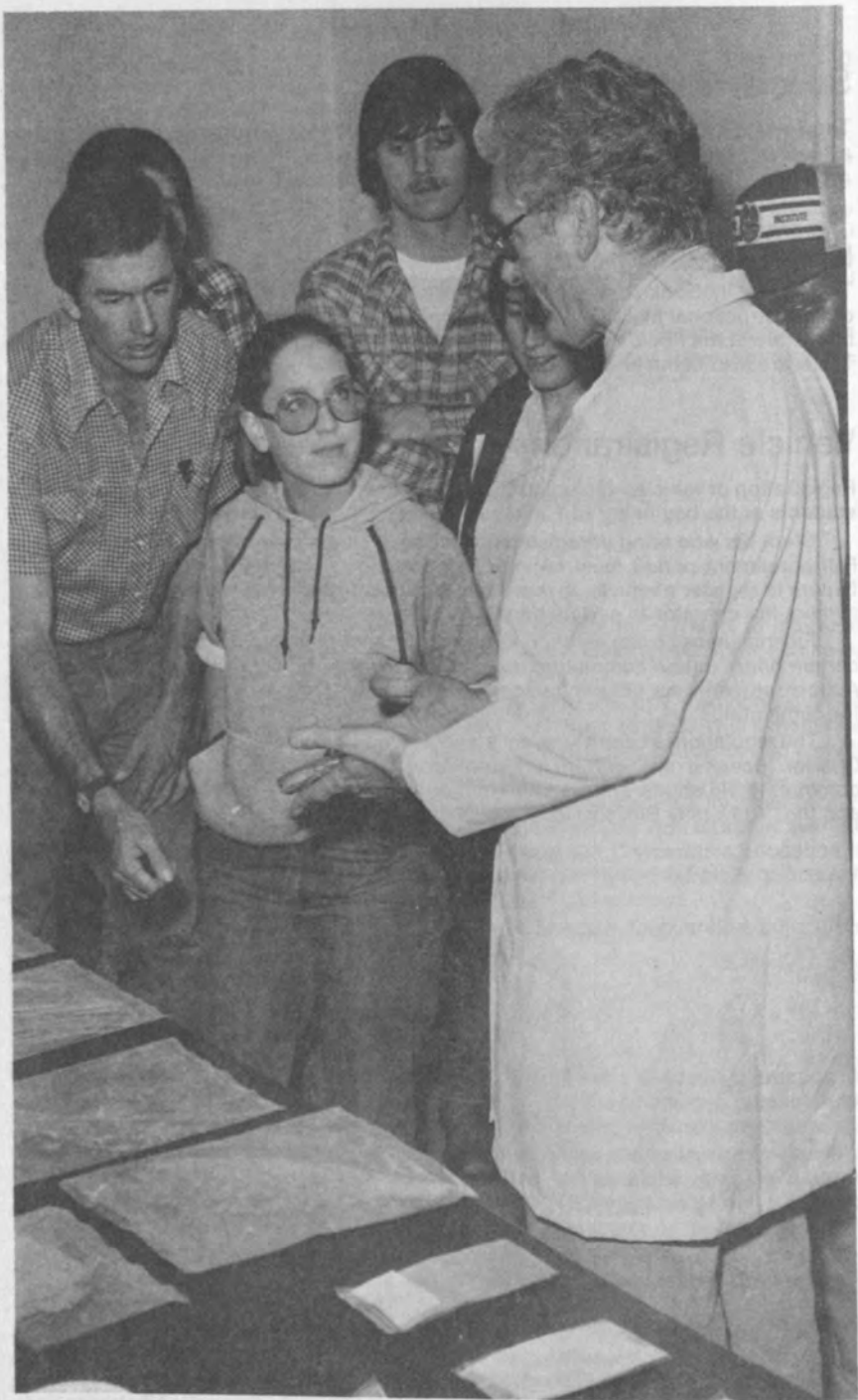
Vehicle Registration

Registration of vehicles, including bicycles, is a part of the enrollment procedure for all students at the beginning of Fall Quarter.

Students who bring unregistered vehicles, including bicycles, to campus after the Fall enrollment period must register them at once at the University Security Office. Failure to register a vehicle, to use the proper decal, and to park in the proper zone will subject the operator to certain penalties.

Freshmen may bring autos to Auburn, but cannot operate them on campus during certain hours unless commuting. Because of the parking situation on campus and in Auburn, students are not encouraged to bring automobiles unless absolutely required for commuting.

The regulations stated above are subject to modification by the beginning of the Fall Quarter. Specific and current information on parking areas, regulations, controls, commuting, violations, and penalties may be found in "Parking and Traffic Regulations" and the "University Bicycle Code," available at the University Security Office.



School of Agriculture, Forestry and Biological Sciences

R. DENNIS ROUSE, *Dean*

E. V. SMITH, *Dean Emeritus*

CHARLES F. SIMMONS, *Dean Emeritus*

THE SCHOOL OF AGRICULTURE, FORESTRY AND BIOLOGICAL SCIENCES prepares students for careers in agriculture and related professions. Courses provide a broad foundation in the basic sciences, a general knowledge of the applied sciences, and a reasonable number of cultural subjects. Most of the basic science courses are given in the freshman and sophomore years and serve as a basis for a better understanding of the applied or more practical subjects which are usually taken in the junior and senior years.

A curriculum is offered in Agricultural Science with majors in Agronomy and Soils, Animal and Dairy Sciences, Poultry Science, Horticulture, and Agricultural Journalism. Other curricula are offered in Agricultural Business and Economics; Agricultural Engineering; Biological Sciences, with majors in Botany, Fisheries Management, Wildlife Management, Entomology, Zoology, Microbiology, and Marine Biology; Food Science; Forest Engineering; Forest Management; Ornamental Horticulture; Plant Protection; and Forest Products. If a student is permitted to major in a field where the courses are not prescribed in the catalog he should consult with the dean.

The School of Agriculture, Forestry and Biological Sciences also furnishes the subject matter training in Agriculture for the curriculum for training teachers of Vocational Agriculture.

Transfer credit will not normally be allowed for any course passed with a grade lower than C at any other college or university.

Credit toward a degree in any curriculum in the School of Agriculture, Forestry and Biological Sciences will not be allowed for a mathematics course at a level lower than that specified in the curriculum. However, students who are not prepared to take the prescribed courses may take lower level courses without degree credit.

Only on the basis of validating examinations by the student will transfer credit in agriculture subjects be accepted from colleges where instruction in these subjects is usually done by faculty members who do not hold graduate degrees in the specific area of their instructional responsibilities. Arrangements for validating examinations must be made with the Dean of Agriculture, Forestry and Biological Sciences in the first quarter of the student's enrollment in the School of Agriculture, Forestry and Biological Sciences at Auburn and the examinations must be completed before the middle of the second quarter. Transfer credit in lieu of courses that are considered to be upper division courses in substance at Auburn University will not be accepted from two-year colleges.

Dual Degree Program Between the School of Agriculture, Forestry and Biological Sciences and the School of Engineering

This program gives students the opportunity to receive two baccalaureate degrees—one in Agriculture and one in Engineering. Although the program was developed primarily

for students desiring a combination of a Biological Sciences program with an Engineering program, it does not preclude the consideration of other Agriculture-Engineering combinations.

In general, the student will be enrolled in the School of Agriculture, Forestry and Biological Sciences for approximately three years and in the School of Engineering for approximately two years. During the first three years, the student should take those mathematics, physics, and chemistry courses necessary to allow him or her to transfer to the School of Engineering. Additionally, before transferring to the School of Engineering, the student should have completed approximately three-fourths of the total hours required by the School of Agriculture, Forestry and Biological Sciences for the awarding of that degree.

To become a dual-degree candidate under this program, the student must have a grade point average which indicates the likelihood of satisfactory completion of Engineering School degree requirements and a recommendation from the Dean of the School of Agriculture, Forestry and Biological Sciences. Recommendation should be sought one quarter before time of expected transfer to the School of Engineering.

It is also possible for very highly qualified students to transfer to the School of Engineering following the junior year with the intent of seeking a Master's Degree rather than a Bachelor's Degree in one of the Engineering disciplines. Consult the Engineering Dean's Office concerning this option.

Agricultural Science (AG)

First Quarter			FRESHMAN YEAR			Third Quarter		
			Second Quarter					
BI 101	Prin. of Biology	5	BI 102	Plant Biology	5	CH 104	Fund. Chem. & Lab.	5
MH 160	Pre-Cal. w. Trig.	5	CH 103	Fund. Chem. & Lab.	5	MH 161	An. Geom. & Cal.	5
EH 101	English Composition	3	EH 102	English Composition	3	EH 103	English Composition	3
HY 101	World History	3	HY 102	World History	3	HY 103	World History	3
	ROTC or Elective	1		ROTC or Elective	1		ROTC or Elective	1
			SOPHOMORE YEAR					
ADS 200	Intr. An. & Dairy Sciences	5	AEC 202	Agr. Economics I	5	ADS 220	An. Biochem. & Nut.	5
BI 103	Animal Biology	5	AY 301	Prin. Grain Prod.	5	HF 201	Orchard Mgt.	5
PS 200	Fnds. of Physics	5	CH 207	Org. Chem. & Lab.	5		Elective	5
PE	ROTC or Elective	1	PE	ROTC or Elective	1		ROTC or Elective	1
	or Elective	1		or Elective	1	PE	or Elective	1
			JUNIOR YEAR					
PH 201	Poultry Science	5	BY 306	Fund. Plant Phys.	5	AY 304	General Soils	5
SC 202	App. Sp. Comm.	3	BY 309	Gen. Plant Path.	5	HF 308	Veg. Crops	5
	Aq. Eng. Elective*	5	JM 315	Technical Journalism	3		Aq. Eng. Elective*	5
	Elective	5		Elective	5		Elective	3
			SENIOR YEAR					
AY 401	Prin. Forage Prod.	5	AEC 301	Ag. Marketing	5	ADS	Elective**	5
FY 350	Farm Forestry	5	AY 404	Fiber & Oil Crops	5	AEC 501	Farm Management	5
	Electives	8		Electives	8	ZY 502	Econ. Entomology	5
							Elective	3

TOTAL—210 QUARTER HOURS

*To be selected from AN 350, 351, 352, 353, and 354.

**May be selected from ADS 401, 403 or 407.

A list of the recommended electives is available in the offices of the adviser and Dean and must be approved by them.

Agronomy And Soils (AY)

Courses are designed to prepare Agronomy graduates for several major areas of endeavor: (1) the chemical industry, producers of fertilizers, herbicides, and other agricultural chemicals; (2) farm-advisory agencies such as soil testing laboratories

and other private consultants; (3) public farm-advisory agencies such as the Agricultural Extension Service or the Soil Conservation Service; (4) research agencies of corporations, U.S. Department of Agriculture, colleges and universities, and State Agricultural Experiment Stations; (5) turfgrass industry; (6) farming.

FRESHMAN YEAR					
First Quarter			Second Quarter		
CH 103	Gen. Chem. & Lab.	5	BI 101	Prin. of Biology	5
MH 160	Pre-Cal. w. Trig.	5	CH 104	Gen. Chem. & Lab.	5
EH 101	English Comp.	3	EH 102	English Comp.	3
HY 101	World History	3	HY 102	World History	3
	ROTC or Elective	1		ROTC or Elective	1
Third Quarter					
BI 102	Plant Biology	5	BI 102	Plant Biology	5
MH 181	An. Geom. & Cal.	5	MH 181	An. Geom. & Cal.	5
EH 103	English Comp.	3	EH 103	English Comp.	3
HY 103	World History	3	HY 103	World History	3
	ROTC or Elective	1		ROTC or Elective	1
SOPHOMORE YEAR					
First Quarter			Second Quarter		
ADS 220	An. Biochem. & Nutrition	5	AY 301	Prin. of Grain Prod.	5
BI 103	Animal Biol.	5	BY 300	General Microbiol.	5
CH 207	Organic Chem. & Lab.	5	GL 110	Physical Geology	5
	ROTC or Elective	1		ROTC or Elective	1
PE	or Elective	1	PE	or Elective	1
Third Quarter					
AEC 202	Ag. Econ. I	5	AEC 202	Ag. Econ. I	5
AY 304	Gen. Soils	5	AY 304	Gen. Soils	5
PS 200	Fnds. of Physics	5	PS 200	Fnds. of Physics	5
PE	ROTC or Elective	1	PE	ROTC or Elective	1
	or Elective	1		or Elective	1

Crops and Soils Option

JUNIOR YEAR					
First Quarter			Second Quarter		
AY 312	Prin. of Weed Sci.	5	ADS 200	Intr. An. & Dairy Sc.	5
AN 350	Soil & Water Tech.	5	HF 308	Vegetable Crops	5
BY 306	Fund. Plant Phys.	5	AY 506	Fertilizers & Soil Test.	5
SC 202	App. Sp. Comm.	3		Elective	3
Third Quarter					
AY 515	Soil Morph.	5	AY 515	Soil Morph.	5
ZY 300	Genetics	5	ZY 300	Genetics	5
JM 315	Technical Journ.	3	JM 315	Technical Journ.	3
	Elective	5		Elective	5
SENIOR YEAR					
First Quarter			Second Quarter		
AEC 501	Farm Mgt.	5	AY 404	Fiber & Oil Crops	5
AY 401	Prin. of Forage Prod.	5	BY 309	Plant Pathology	5
FY 350	Farm Forestry	5		Elective	8
	Elective	3		Elective	8
Third Quarter					
AY 502	Soil Fertility	5	AY 502	Soil Fertility	5
ZY 502	Econ. Ent.	5	ZY 502	Econ. Ent.	5
	Elective	8		Elective	8

The student must take at least 5 hours from AN 351, 352, 353, and 354; and 9 hours of electives must come from Humanities and Fine Arts, and Social Sciences.

TOTAL—210 QUARTER HOURS

Turf Management Option

JUNIOR YEAR					
First Quarter			Second Quarter		
AN 350	Soil & Water Tech.	5	HF 221	Landscape Gardn.	5
AY 315	Turfgrass Mgt.	5	AY 506	Fertilizers & Soil Test.	5
BY 306	Fund. Plant Phys.	5		Elective	8
SC 202	App. Sp. Comm.	3		Elective	8
Third Quarter					
AY 515	Soil Morph.	5	AY 515	Soil Morph.	5
ZY 300	Genetics	5	ZY 300	Genetics	5
JM 315	Technical Journ.	3	JM 315	Technical Journ.	3
	Elective	5		Elective	5
SENIOR YEAR					
First Quarter			Second Quarter		
AY 401	Prin. Forage Prod.	5	ACF 215	Gen. & Cost Acct.	5
AY 312	Prin. Weed Sci.	5	BY 309	Plant Pathology	5
AY 516	Adv. Turf Mgt.	5	HF 521	Care & Maint. of Ornamentals	5
	Elective	3		Elective	3
Third Quarter					
AY 502	Soil Fertility	5	AY 502	Soil Fertility	5
AY 499	Special Prob.	5	AY 499	Special Prob.	5
ZY 502	Econ. Ent.	5	ZY 502	Econ. Ent.	5
	Elective	3		Elective	3

The student must take at least 5 hours from AN 351, 352, 353, and 354; and 9 hours of electives must come from Humanities and Fine Arts, and Social Sciences.

TOTAL—210 QUARTER HOURS

Animal and Dairy Sciences (ADS)

This curriculum is designed to qualify the graduate in the basic and applied sciences in preparation for a future in the management of animal production units; for work with

governmental and private agricultural agencies; for entering the fields of processing dairy products and meats; for pursuit of scientific investigations in the field of animal agriculture; and for teaching.

Students may select a terminal degree option and prepare themselves to become (1) owners or managers of livestock farms; (2) feedlot managers; (3) livestock buyers and graders; (4) agricultural communication workers; and (5) representatives for animal agri-business.

Students are encouraged to take the graduate preparatory option if they anticipate the possibility of advanced study beyond the B.S. degree. Advanced study is necessary in preparing for most positions in teaching, extension education and research in universities and animal allied industries.

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
MH 160	Pre-Cal w. Trig.	5	CH 103	Fund. Chem. I	4	CH 104	Fund. Chem. II	4
EH 101	English Comp.	3	CH 103L	Gen. Chem. Lab.	1	CH 104L	Gen. Chem. Lab.	1
ADS 200	Intr. An. & Dairy Sci.	5	MH 151	Finite Math or		BI 101	Gen. Biology	5
HY	Requirement*	3	MH 161	An. Geom. & Cal.	5	EH 103	English Comp.	3
PE	ROTC or Elective	1	EH 102	English Comp.	3	ADS 110	Orient. to An. &	
	or Elective	1	HY	Requirement*	3		Dairy Sci.	1
			PE	ROTC or Elective	1	HY	Requirement*	3
				or Elective	1	PE	ROTC or Elective	1
							or Elective	1

SOPHOMORE YEAR

CH 207	Organic Chem.	4	PS 200	Fund of Physics or		AEC 202	Agr. Economics	5
CH 207L	Organic Chem. Lab.	1	PS 205	Intr. Physics	5	ZY 300	Genetics	5
ADS 220	Anim. Biochem. & Nutr.	5	BY 300	Gen. Microbiol.	5	SC 211	Public Speaking	5
BI 103	Animal Biol.	5	ADS 260	Growth & Body Comp.	5		Fine Arts Elective	3
	Elective	1		Elective	1		ROTC or Elective	1
	ROTC or Elective	1		ROTC or Elective	1			

JUNIOR YEAR

ADS 320	Feeds & Feeding	4	ADS 350	Animal Breeding	5	ADS 361	Repro Physiol.	5
ZY 316	Physiol. Dom. Anim.	5	ADS 370	Meat Science or			Communications	
AY 304	Soils	5	ADS 375	Fund Dairy Proc.	5		Req.*	3 or 5
	Prof. Elective†	3		Elective	4	ADS 380	Undergrad Sem.	1
				Prof. Elective†	3	AY 301	Grains or	
						AY 401	Forage Production	5
							Prof. Elective†	3

SENIOR YEAR

AEC 501	Farm Mgt.	5	ADS	Production Req.**	5		Prof. Elective†	17
ADS	Production Req.**	5		Prof. Elective†	12			
	Prof. Elective†	7						

TOTAL—210 QUARTER HOURS

*World History 101-102-103 (3-3-3) or Technology & Civilization 204-205-206 (3-3-3) or World Literature (EH) 260-261-262 (3-3-3) or Art History 171-172-173 (3-3-3).

**EHA 304 (3), EHA 315 (3) or SC 511 (5).

***A minimum of 10 hrs. from ADS 401 (5), ADS 403 (5), ADS 405 (5), and ADS 407 (5).

†A minimum of 45 credit hrs. must be taken from the list of electives for one of the suggested options that is available in the offices of the adviser and the dean and must be approved by them.

Pre-Veterinary Medicine Option

The following curriculum composed of nine quarters (159 quarter hours) will satisfy the minimum requirements for admission to the School of Veterinary Medicine. Satisfactory completion of the remaining requirements of the Animal-Dairy Science curriculum or completion of one year in the Veterinary Medicine curriculum entitle the student to the B.S. degree in Animal and Dairy Sciences.

FRESHMAN YEAR		
First Quarter		
CH 103	Fund of Chem. & Lab.....	5
ADS 200	Intr. An. & Dairy Sci.....	5
HY 101	World History.....	3
EH 101	English Comp.....	3
PE	ROTC or Elective.....	1
	or Elective.....	1
Second Quarter		
CH 104	Fund. of Chem. & Lab.....	5
MH 160	Pre-Cal w/Trig.....	5
HY 102	World History.....	3
EH 102	English Comp.....	3
PE	ROTC or Elective.....	1
	or Elective.....	1
Third Quarter		
CH 105	Fund. of Chem. & Lab.....	5
MH 161	An. Geom. & Calc.....	5
HY 103	World History.....	3
EH 103	English Comp.....	3
PE	ROTC or Elective.....	1
	or Elective.....	1
SOPHOMORE YEAR		
First Quarter		
BI 101	Prin. Biol.....	5
CH 207	Organic Chem. & Lab.....	5
ADS 370	Meat Science.....	5
	ROTC or Elective.....	1
Second Quarter		
BI 103	Animal Biol.....	5
CH 208	Organic Chem. & Lab.....	5
ADS 220	Anim. Biochem. & Nutr.....	5
EH 141	Med. Vocab.....	3
	ROTC or Elective.....	1
Third Quarter		
BI 102	Plant Biol.....	5
ZY 316	Physiol. Dom. Anim.....	5
PS 205	Intr. Physics.....	5
	ROTC or Elective.....	1
JUNIOR YEAR		
First Quarter		
PS 206	Intr. Physics.....	5
BY 300	Microbiology.....	5
ZY 300	Genetics.....	5
ADS 260	Growth & Body Comp.....	4
Second Quarter		
ADS 361	Reproductive Physiol.....	5
AY 304	General Soils.....	5
EHA 304	Technical Writing.....	3
ADS 320	Feeds & Feeding.....	4
Third Quarter		
ADS 350	Anim. Breeding.....	5
AEC 202	Agr. Economics.....	5
PO 209	American Govt.....	5
	Elective.....	3

See also, curriculum in Pre-Veterinary Medicine (PV), School of Arts and Sciences.

Horticulture (HF)

The Horticulture major is designed to prepare the student for a future in the fruit or vegetable industry. Advanced study in Horticulture leads to professional positions in teaching, research, or extension.

FRESHMAN YEAR		
First Quarter		
BI 101	Prin. of Biology.....	5
MH 160	Pre-Cal. w. Trig.....	5
EH 101	English Comp.....	3
HF 101	Intr. to Hort.....	1
PE	ROTC or Elective.....	1
	or Elective.....	1
Second Quarter		
BI 102	Plant Biology.....	5
EH 102	English Comp.....	3
HY 101	World History.....	3
CH 103	Fund. Chem. & Lab.....	5
PE	ROTC or Elective.....	1
	or Elective.....	1
Third Quarter		
CH 104	Fund. Chem. & Lab.....	5
MH 161	An. Geom. & Cal.....	5
EH 103	English Comp.....	3
HY 102	World History.....	3
PE	ROTC or Elective.....	1
	or Elective.....	1
SOPHOMORE YEAR		
First Quarter		
HF 224	Plant Propagation.....	5
HF 221	Landscape Garden.....	5
SC 211	Public Speaking.....	5
HY 103	World History.....	3
	ROTC or Elective.....	1
Second Quarter		
BI 103	Animal Biology.....	5
AEC 202	Ag. Economics I.....	5
CH 207	Organic Chem. & Lab.....	5
JM 315	Technical Journalism.....	3
	ROTC or Elective.....	1
Third Quarter		
GL 110	Physical Geo.....	5
HF 201	Orchard Mgt.....	5
PS 200	Fnds. of Physics.....	5
	ROTC or Elective.....	1
JUNIOR YEAR		
First Quarter		
AN 350	Soil and Water Technology.....	5
BY 306	Fund. of Plant Physiology.....	5
	Electives.....	8
Second Quarter		
AEC 301	Ag. Marketing.....	5
HF 308	Vegetable Crops.....	5
AY 304	General Soils.....	5
	Elective.....	3
Third Quarter		
AY 502	Soil Fertility.....	5
BY 309	Plant Pathology.....	5
ZY 300	Genetics.....	5
	Elective.....	3
SENIOR YEAR		
First Quarter		
HF	Elective*.....	5
	Agri. Engineering.....	5
	Elective.....	5
	Elective.....	6
Second Quarter		
HF 501	Com. Veg. Crops.....	5
ZY 502	Economic Ento.....	5
HF	Elective*.....	5
	Elective.....	3

TOTAL—210 QUARTER HOURS

*Students are required to take two of the following Horticulture electives: HF 504, Fruit Growing; HF 505, Small Fruits; HF 506, Nut Culture.

Poultry Science (PH)

A program is offered with the option of science or business. In most cases students anticipating study beyond the B.S. degree should choose electives for the science option. The electives in the business area provide the student opportunity to prepare for sales, service, and related agribusiness professions.

First Quarter			FRESHMAN YEAR			Third Quarter		
			Second Quarter					
BI 101	Prin. of Biology	5	BI 102	Plant Biology	5	BI 103	Animal Biology	5
CH 103	Fund. of Chem. & Lab.	5	CH 104	Fund. of Chem. & Lab.	5	GL 101	Intr. Geology I	5
MH 160	Pre-Cal. w. Trig.	5	MH 161	An. Geom. & Cal.	5	HY 101	World History	3
PE	ROTC or Elective	1	EH 101	English Comp.	3	EH 102	English Comp.	3
				ROTC or Elective	1		ROTC or Elective	1
			SOPHOMORE YEAR					
CH 207	Organic Chem & Lab.	5	AEC 202	Ag. Economics I	5	ADS 220	An. Biochemistry & Nutrition	5
PH 201	Poultry Science	5	PA 211	Intr. to Deductive Logic	3	PS 200	Fnds. of Physics or	
HY 102	World History	3	HY 103	World History	3	PS 205	Intr. Physics	5
EH 103	English Comp.	3	SC 202	App. Sp. Comm.	3	PG 211	Psychology	5
PE	ROTC or Elective	1	PE	ROTC or Elective	1	PE	ROTC or Elective	1
			JUNIOR YEAR					
AY 304	General Soils	5	RSY 261	Rural Sociology	5	AEC 301	Ag. Marketing	5
PH 302	Poultry Meat Prod.	3	ZY 300	Genetics	5	SC 273	Group Prob. Solv. through Discussion	5
EHA 304	Technical Writing	3		Electives	8		Electives	8
BY 300	General Microbiology	5						
	Elective	3						
			SENIOR YEAR					
ZY 502	Economic Entomology or		PH 504	Poultry Mgt.	5	AEC 501	Farm Management	5
ZY 511	General Parasitology	5	PH 508	Control of Poultry Diseases & Parasites	5	PH 511	Processing & Mkt.	3
PH 505	Poultry Feeding	3		Electives	8		Electives	8
	Electives	10						

TOTAL—210 QUARTER HOURS

*Students choosing the science option should take PS 205 to prepare for more work in these areas.

Of the 47 hours of electives, 30 must be selected from the list that is available in the offices of the adviser and Dean and must be approved by them.

Agricultural Business And Economics (AEC)

The curriculum in Agricultural Business and Economics is for students who plan a career in business closely related to agriculture, and for those interested in the economics of agricultural production and marketing and in public policies affecting agriculture.

The curriculum combines both business and technical agricultural courses, and through selection of electives it provides an opportunity for students to emphasize training in agribusiness, in agricultural economics, in food science, in humanities, or in selected production fields.

The demand for graduates who have both business and applied agricultural training is increasing. In both public and private agencies, increasing attention to rural economic and social problems points to enlarged opportunities for qualified workers in teaching, research, sales, public relations, services, administration, and private employment in these fields. By electing appropriate courses in the food science management area, Agricultural Business and Economics students can prepare for management positions in the vast food industry.

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
MH 160	Pre-Cal w. Trig.	5	MH 161	An. Geom. & Cal.	5	CH 104	Fund. Chem. & Lab.	5
BI 101	Prin. of Biology	5	CH 103	Fund. Chem. & Lab.	5	BI 102	Plant Biology	5
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
HY 101	World History	3	HY 102	World History	3	HY 103	World History	3
PE	or Elective	1	PE	or Elective	1	PE	or Elective	1
	ROTC or Elective	1		ROTC or Elective	1		ROTC or Elective	1

SOPHOMORE YEAR

ADS 220	Animal Biochem. & Nutrition	5	PO 209	Intr. Am. Govt.	5	MN 274	Bus. & Econ. Stat. I	5
AEC 202	Ag. Economics I	5	PS 200	Fnds. of Physics	5	RSY 261	Rural Sociol.	5
BI 103	Animal Biology	5	ACF 211	Prin. of Acct.	4	ACF 212	Prin. of Acct.	4
MN 207	Intr. Computer Prog.	3	SC 202	App. Sp. Comm.	3		ROTC or Elective	1
	ROTC or Elective	1		ROTC or Elective	1		Elective	3

JUNIOR YEAR

ADS 200	Intr. An. & Dairy Sc.*	5	AEC 301	Ag. Marketing	5	AN 351	Ag. Mach. Tech. **	5
AY 307	Gen. Soils	5	PH 201	Poultry Science	5	EC 360	Money and Banking	5
EHA 315	Bus. and Prof. Report Writing I	3	AEC 307	Ag. Law	5	AEC 206	Ag. Econ. II	5
	Elective	3		Elective	3		Electives	3

SENIOR YEAR

EC 552	Comp. Econ. Systems or Inter. Macro-econ.	5	AY 401	Forage Prod. or Grain Prod.	5	AEC 501	Farm Management	5
EC 556	Ag. Bus. Mgt.	3	FY 350	Farm Forestry	5	AEC 505	Ag. Policy	3
EHA 415	Written Bus. Comm.	3	AEC 503	Ag. Prices	3		Electives	8
	Elective	5	AEC 490	Senior Seminar	1			
				Elective	3			

TOTAL—210 QUARTER HOURS

*ADS 401, ADS 403, or ADS 407 may be substituted.

**AN 350, AN 352, AN 353 or AN 354 may be substituted.

A list of the recommended electives is available in the offices of the adviser and Dean and must be approved by them.

Agricultural Engineering (AN)

This technical field trains engineers in the agricultural areas. The curriculum includes courses basic to all types of engineering, courses with particular emphasis on engineering problems in agriculture, and general agricultural courses. Students completing the curriculum have opportunities in many types of work where both engineering and agricultural knowledge are required.

The Agricultural Engineering curriculum is accredited by the Accreditation Board for Engineering and Technology.

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
MH 161	An. Geom. & Cal.	5	MH 162	An. Geom. & Cal.	5	MH 163	An. Geom. & Cal.	5
BI 101	Prin. of Biology	5	CH 103	Gen. Chem. & Lab.	5	CH 104	Gen. Chem. & Lab.	5
AN 101	Intr. to Ag. Eng.	2	EH 101	English Comp.	3	EH 102	English Comp.	3
TS 102	Graph. Comm. & Design	2	AN 102	Ag. Engr. Prin.	2	PE	or Elective	1
PE	or Elective	1	PE	or Elective	1		ROTC or Elective	1
	ROTC or Elective	1		ROTC or Elective	1			

SOPHOMORE YEAR

MH 264	An. Geom. & Cal.	5	PS 221	Gen. Physics II	4	ME 202	Engr. Mat. Science	3
BI 102	Plant Biology	5	ME 207	Strength of Mat. or Mech. of Solids	3	CHE 331	Engr. Thermodyn.	3
PS 220	Gen. Physics I	4	CE 207	Mech. of Solids	3		or	
ME 205	Appl. Mech. Stat. or Engr. Mech. Stat.	4	EH 103	English Comp.	3	ME 301	Thermodynamics I	4
CE 205	ROTC or Elective	1	BI 103	Animal Biol.	5	ME 321	Dynamics I	4
			MH 265	Diff. Equat.	3	PS 222	Gen. Physics III	4
				ROTC or Elective	1	IE 204	Comp. Prog.	3
							ROTC or Elective	1

First Quarter			JUNIOR YEAR			Third Quarter		
			Second Quarter					
EE 261	Circuit Anal. I.....	3	AEC 202	Ag. Econ. I.....	5	MH	Elective.....	3
AN 301	Mech. of Farm Mach.....	3	EE 263	Circuit Anal. II.....	4	AN 306	Elec. Systems.....	3
AN 307	Structures Des. I.....	3	AN 302	Mech. of Trac.....	3	AN 304	Drain. & Irrig.....	3
CE 308	Hydraulics or.....	5		Power.....	3		Ag. Engr.....	3
ME 340	Fluid Mech.....	3	AN 305	Agric. Proc. Eng.....	3		Elective.....	3
	History Elective*.....	3		History Elective.....	3		Elec. Engr. Elective.....	3
	Engr. Elective.....	4					History Elective*.....	3
			SENIOR YEAR					
AN 303	Soil & Water Engr. I.....	3		Hum.-Soc. Elective.....	5		Social & Hum.....	
AN 303L	Soil & Water			Ag. Elective.....	5		Elective.....	7
	Engr. Lab.....	1		Ag. Engr. Elective.....	3		Ag. Elective.....	5
AY 307	Gen. Soils.....	5		Engr. Elective.....	3		Engr. Elective.....	3
SC 202	App. Sp. Comm.....	3						
	Engr. Electives.....	7						

TOTAL—210 QUARTER HOURS

SC 202 will be waived for students who complete a year of Advanced ROTC.

A list of the recommended electives is available in the offices of the adviser and Dean and must be approved by them.

*Students may choose Technology and Civilization HY 204, 205, 206 or World History 101, 102, 103.

Biological Sciences (BI)

Botany (BY)

The Botany major is for those students interested in fundamental plant science. The required courses serve as a basis for knowledge of plants and future experimentation with plant systems. Proper elective selection prepares students for various careers in the plant sciences. The curriculum is administered through a faculty advisory system for the best interests and needs of each student.

First Quarter			FRESHMAN YEAR			Third Quarter		
			Second Quarter					
BI 101	Prin. of Biology.....	5	BI 102	Plant Biology.....	5	BI 103	Animal Biology.....	5
MH 160	Pre-Cal. w. Trig.....	5	MH 161	An. Geom. & Cal.....	5	CH 103	Fund. Chem.....	5
EH 101	English Comp.....	3	EH 102	English Comp.....	3		& Lab.....	5
HY 101	World History.....	3	HY 102	World History.....	3	EH 103	English Comp.....	3
	ROTC or Elective.....	1		ROTC or Elective.....	1	HY 103	World History.....	3
			SOPHOMORE YEAR					
CH 104	Fund. Chem & Lab.....	5	CH 207	Org. Chem. & Lab.....	5	BY 300	Gen. Micro-Biology I.....	5
ZY 300	Genetics.....	5	BY 309	Gen. Plant Pathology.....	5	CH 208	Org. Chem.....	5
EC 200	Gen. Economics or.....	5	GL 110	Phys. Geol.....	5		& Lab.....	5
AEC 202	Ag. Economics I.....	5		ROTC or Elective.....	1	ZY	Zoology Elective.....	5
	ROTC or Elective.....	1	PE	or Elective.....	1		ROTC or Elective.....	1
PE	or Elective.....	1				PE	or Elective.....	1
			JUNIOR YEAR					
SC 211	Public Speaking.....	5	PS 206	Intr. Physics.....	5	BY 306	Fund. Plant Physiology.....	5
PS 205	Intr. Physics.....	5	AY 304	General Soils.....	5		Zoology Elec.....	5
BY 215	Intr. Biol. Stat. or.....	5	EHA 304	Tech. Writing or.....	3	ZY	Philosophy Elec.....	3
BY 501	Biol. Statistics.....	5	EHA 315	Elective.....	5	PA	Elective.....	5
	Elective.....	3						
			SENIOR YEAR					
BY 513	Gen. Plant Ecology.....	5	BY 515	Plant Anatomy.....	5	BY 506	Systematic Botany.....	5
FL 121	French or.....	5	FL 122	French or.....	5		Electives.....	13
FL 151	German.....	5	FL 152	German.....	5			
ZY	Zoology Elective.....	5		Electives.....	8			
	Elective.....	3						

TOTAL—210 QUARTER HOURS

Students in consultation with their academic advisers should take a minimum of 10 hours of electives in each of the three areas of Science and Mathematics, Humanities and Fine Arts, and Social Studies.

Microbiology (MB)

FRESHMAN YEAR

First Quarter

BI 101	Prin. of Biol.	5
MH 160	Pre-Cal. w. Trig.	5
EH 101	English Comp.	3
HY 101	World History	3
	ROTC or Elective	1

Second Quarter

MH 161	An. Geom. & Cal.	5
EH 102	English Comp.	3
HY 102	World History	3
CH 103	Fund. Chem. & Lab.	5
	ROTC or Elective	1

Third Quarter

CH 104	Fund. Chem. & Lab.	5
EH 103	English Comp.	3
HY 103	World History	3
BI 102	Plant Biology	5
	ROTC or Elective	1

SOPHOMORE YEAR

BI 103	Animal Biology	5
PS 205	Intr. Physics	5
CH 207	Org. Chem. & Lab.	5
	ROTC or Elective	1
PE	or Elective	1

CH 208	Org. Chem. & Lab.	5
FL 121	French or	
FL 151	German*	5
PS 206	Intr. Physics	5
	ROTC or Elective	1
PE	or Elective	1

ZY 300	Genetics	5
BY 300	Gen. Microbiol.	5
FL 122	French or	
FL 152	German*	5
	ROTC or Elective	1
PE	or Elective	1

JUNIOR YEAR

CH 518	Biochemistry	5
PA 210	Intr. Philosophy	3
BY 400	Techniques in Microbiol.	5
AEC 202	Ag. Econ. or	
EC 200	Gen. Economics	5

CH 519	Biochemistry	5
BY 543	Immunology	5
BY 503	Bacterial Taxonomy	5
	Elective	3

SC 211	Public Speaking	5
BY 446	Clin. and Path. Micro	5
	Electives	8

SENIOR YEAR

BY 540	Microbial Phys. and Genetics	3
	Electives	15

Electives	18
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Electives	18
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Electives may be selected from the following groups with at least 6 from A, an additional 30 from A or B, and the remaining from groups A, B, or C.

Group A

ADS 514	Food Microbiology	5
BY 215	Intr. Biol. Stats.	5
BY 504	Industrial Microbiology	3
BY 505	Intr. Mycology	5
BY 542	Virology	3
ZY 519	Molecular Genetics	5

Group B

ADS 515	Food Plant Sanitation	5
BY 216	Intr. Biol. Computat.	3
BY 309	Gen. Plant Pathology	5
BY 508	Marine Microbiology	7
BY 514	Biological Microscopy	5
BY 521	Industrial Microbiology Lab	3
BY 541	Environmental Microbiology	5
CH 316	Physical Chemistry	5
CH 520	Clinical Biochemistry	3
EHA 304	Technical Writing	3
FAA 516	Biological Productivity & Water Quality	5
HF 543	Food Anal. & Qual. Ctrl.	5
LT 301	Hematology	5
MT 344	Environmental Law	4
U 270		
U 271		
U 272	Ascent of Man	9
ZY 511	Parasitology	5
ZY 524	Animal Physiology	5

Group C

University courses not included in Groups A or B. Selection to be determined in consultation with adviser.

TOTAL—210 QUARTER HOURS

During the Sophomore Year students will develop a plan of study for the Junior and Senior Years from lists of approved elective courses with the assistance and approval of their adviser and dean. Substitutions may be permitted to meet specific needs of individual students.

*Any foreign language acceptable; French or German preferred.

Zoological Sciences

Majors in zoological sciences are for students interested in careers in animal biology. One has the choice of five options: zoology, entomology, fisheries, marine biology, or wildlife, and degrees are offered in each option. During the first two years, all students take the same subjects which emphasize the basic sciences and background courses. Thereafter, it is possible to elect courses to fit specific needs of the student in his or her option.

Entomology, Fisheries Management, Marine Biology, Wildlife Management, and Zoology

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
BI	101	Prin. of Biology.....5	BI	102	Plant Biology.....5	BI	103	Animal Biology.....5
CH	103	Fund. Chem. & Lab.....5	CH	104	Fund. Chem. & Lab.....5	MH	162	An. Geom. & Cal.....5
MH	160	Pre-Cal. w. Trig.....5	MH	161	An. Geom. & Cal.....5	PS	205	Intr. Physics.....5
PE		ROTC or Elective.....1	PE		ROTC or Elective.....1	PE		ROTC or Elective.....1
		or Elective.....1			or Elective.....1			or Elective.....1

SOPHOMORE YEAR

PS	206	Intr. Physics.....5	ZY	303	Syst. & Evolution.....5	CH	208	Organic Chem. & Lab.....5
ZY	300	Genetics.....5	CH	207	Organic Chem. & Lab.....5	ZY	306	Prin. of Ecology.....5
EH	101	English Comp.....3	EH	102	English Comp.....3	EH	103	English Comp.....3
HY	101	World History.....1	HY	102	World History.....1	HY	103	World History.....1
		ROTC or Elective.....1			ROTC or Elective.....1			ROTC or Elective.....1

JUNIOR YEAR

54 hours to be arranged in consultation with adviser.

SENIOR YEAR

54 hours to be arranged in consultation with adviser.

TOTAL HOURS REQUIRED—210 QUARTER HOURS

ADDITIONAL COURSES TO BE TAKEN BY ALL MAJORS

AEC	202	Ag. Economics I.....5	ZY	310	Cell Biology.....5
BY	300	General Microbiology.....5	ZY	511	Parasitology**.....5
SC	211	Public Speaking.....5	ZY	521	or 522 Vert. Zoology**.....5
EH	390	Advanced Composition.....5	ZY	524	Animal Physiology.....5
ZY	301	Comp. Anatomy.....5	ZY	501	Invert. Zoology.....5
ZY	304	Gen. Entomology.....5			

*Except Fisheries

**Fisheries students will take BY 306 and FAA 538 in lieu of these courses

***Except Wildlife

The remaining requirements will include a minimum of 17 hours selected from the humanities and social sciences and at least 35 hours of group electives selected with the advice of the adviser and approval of the Dean. At least 10 hours of the group electives must be selected from the following botanical sciences: BY 306, 309, 506, 509, 513, 515, and 516. Recommended electives from the humanistic social sciences and group electives are available from the adviser and Dean. All students in Marine Biology must spend at least one quarter at a marine biology laboratory and take 15 to 18 hours of course work there. Students in wildlife must take ZY 528 and ZY 531.

Biological Sciences and Teacher Education

Students in the Biological Sciences curriculum with majors in either botanical or zoological sciences who wish also to prepare for certification as teachers in secondary schools may pursue the dual objective of completing the requirements for the B.S. degree in their particular Biological Sciences major and the requirements of the Teacher Education Program.

Students who choose the dual objective program should declare this intent to their departmental advisers by the end of their sophomore year if possible. Students pursuing the dual objective plan will be assigned an adviser in the School of Education who will advise them on all matters involving requirements for completing the Teacher Education Program. (See detailed discussion of admission and retention procedures for teacher education on page 136.)

In addition to the specific requirements, including group electives required for the B.S. in Zoological Sciences or Botany, these students must also include the following courses in their curriculum:

Forest Engineering (FYE)

This curriculum combines professional courses in engineering and forestry for students who want careers in the forest industries that require training in both engineering and forestry. It has been developed to meet the accreditation requirements of both the Accreditation Board for Engineering and Technology and the Society of American Foresters. This curriculum is jointly administered by the Departments of Forestry and Agricultural Engineering.

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
MH 161	An. Geom. & Cal.	5	MH 162	An. Geom. & Cal.	5	MH 163	An. Geom. & Cal.	5
BI 101	Prin. of Biology	5	BI 102	Plant Biology	5	EC 200	Econ. I	5
TS 102	Graph. Comm. & Design	2	IE 204	Comp. Prog.	3	CH 103	Fund. of Chem. & Lab.	5
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
PE	or Elective	1	PE	or Elective	1	PE	or Elective	1

SOPHOMORE YEAR

MH 264	An. Geom. & Cal.	5	ME 207	Strength of Mat.	3	AY 305	Gen. Soils	5
PS 220	Gen. Physics I	4	PS 221	Gen. Physics II	4	PS 222	Gen. Physics III	4
ME 205	Appl. Mech. Stat.	4	ME 202	Engr. Mat. Science	3	ME 301	Thermodynamics I	4
CH 104	Fund. of Chem. & Lab.	5	MH 265	Diff. Equat.	3	ME 321	Dynamics I	4
			EC 202	Econ. II	5			

SUMMER CAMP**

FY 300	Intr. to Forestry	2
FY 301	Dendrology	3
FY 302	Forest Biology	2
FY 304	Forest Surveying	4
FY 305	Field Mensuration	3
FY 306	For. Cartography	1

JUNIOR YEAR

FY 313	Sampling I	4	FY 314	Sampling II	4	FY 421	For. Ecology	5
	Elective (Social Sci. & Humanities)	5	FY 415	For. Mensuration	5	FY 517	Photogrammetry	5
AN 301	Mech. of Farm Machinery	3	EE 263	Circuit Analysis II	4	ACF 211	Accounting	4
ME 340	Fluid Mech.	3	AN 302	Mech. of Trac. Power	3		Engr. Elective	4
EE 261	Circuit Analysis I	3		History or Literature***	3			

SENIOR YEAR

FY 540	For. Econ.	4	FY 541	For. Mgt. & Admin.	4	AN 501	Ag. Power & Mach. Design	3
FY 520	Silviculture	5	FY 570	Harvesting	3	FY 571	Adv. Harv.	3
AN 401	Forest Machinery	3	AN 402	Roads & Struc.	3		History or Literature	3
	Engr. Elective	3		Social Sci. & Humanities Elective	5		Engr. Elective	8
	History or Literature	3						

TOTAL — 225 QUARTER HOURS

*Students whose combined ACT scores for English and Mathematics are lower than 50, or whose total SAT scores are less than 1100, are enrolled in MH 160 for no credit.

**Summer Camp may be taken at the end of either the Freshman or Sophomore years. It may be taken between the Freshman and Sophomore years by a transient student who is regularly enrolled at another institution and is planning to transfer to Auburn University. Students must be in residence at the camp.

***Selected from one of the following sequences: HY 101-102-103; HY 204-205-206; EH 260-261-262.

Forestry

Two curricula are offered in the Department of Forestry, one in Forest Management and the other in Forest Products. The former leads to the degree of Bachelor of Science in Forestry while the other leads to the degree of Bachelor of Science in Forest Products. The Department also offers an honors program which leads to the degree of Bachelor of Science in Forestry (Honors Program). The department in conjunction with the Department of Agricultural Engineering also offers a curriculum in Forest Engineering.

The Department of Forestry is accredited by the Society of American Foresters.

Forest Management (FY)

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
BI 101	Prin. of Biology	5	BI 102	Plant Biology	5	SC 211	Public Speaking	5
MH 161	An. Geom. & Cal.*	5	MH 162	An. Geom. & Cal.	5	MH 163	An. Geom. & Cal.	5
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
PE	ROTC or Elective	1	PE	ROTC or Elective	1	PE	ROTC or Elective	1
	or Elective	1		or Elective	1		or Elective	1

SUMMER CAMP**

FY 300	Intr. to Forestry	2
FY 301	Dendrology	3
FY 302	Forest Biology	2
FY 304	Forestry Surveying	4
FY 305	Field Mensuration	3
FY 306	Forest Cartography	1

SOPHOMORE YEAR

CH 103	Fund. of Chem. & Lab. 5	CH 104	Fund. of Chem. & Lab. 5	PS 200	Found. of Physics	5
	Economics***		Economics	ACF 211	Prin. of Account	4
MT 241	Business Law†	IE 204	Comp. Prog.	GL 110	Phys. Geology	5
	History or Lit.		History or Lit.		History or Lit.	3
	ROTC or Elective		ROTC or Elective		ROTC or Elective	1

JUNIOR YEAR

FY 313	Sampling I	4	FY 314	Sampling II	4	FY 421	For. Ecology	5
FY 320	For. Tree Physiol.	3	FY 415	For. Mensuration	5	FY 422	For. Geography	2
EHA 304	Tech. Writing	3	AY 305	Gen. Soils	5	FY 462	For. Rec. Plan. & Mgt.	3
	Elective††	5	FY 439	Wood ID & Prod.	3	FY 517	Photogram	5

SENIOR YEAR

FY 540	For. Econ.	4	FY 541	For. Mgt. & Admin.	4	FY 481	For. Prob. II	4
FY 520	Silviculture	5	FY 445	For. Fire Cont. & Use	3	FY 542	For. Policy	3
ZY 305	For. Entomology	3	FY 570	Harvesting	3	BY 310	For. Pathology	3
	Elective	5	FY 480	For. Prob. I	0		Elective	5
			ZY 425	For. Wildlife Mgt.	3			
				Elective	5			

TOTAL — 210 QUARTER HOURS

*Students whose combined ACT scores for English and mathematics are lower than 50, or whose total SAT scores are less than 1100, are enrolled in MH 160 for no credit.

**Summer camp may be taken at the end of either the Freshman or Sophomore years. It may be taken between the Freshman and Sophomore years by a transient student who is regularly enrolled at another institution and is planning to transfer to Auburn University. Co-op students should take Summer Camp at the end of the Freshman Year. Students must be in residence at the camp.

***Selected from one of the following sequences: EC 200-202 or AEC 202-206.

†Selected from one of the following sequences: HY 101-102-103; HY 204-205-206; or EH 260-261-262.

‡AEC 307, Agricultural Law may be substituted for MT 241, Business Law.

††At least one elective course must be chosen from the humanities.

HONORS PROGRAM IN FORESTRY

The Honors Program in Forestry provides able students opportunity to explore in depth areas in which they are interested and to prepare for graduate school. The program is flexible, permitting concentration of effort in areas of the student's choosing.

Students with at least five quarters remaining in the Forest Management curriculum and with a grade point average of 2.90 or better may apply for admission to the program.

JUNIOR YEAR

First Quarter			Second Quarter			Third Quarter		
FY 313	Sampling I	4	FY 314	Sampling II	4	FY 421	For. Ecology	5
FY 320	For. Tree Physiol.	3	FY 415	For. Mensuration	5	BY 501	Biolog. Stat.	5
	Electives	9	AY 305	Gen. Soils	5		Elective	5
				Elective	3			

SENIOR YEAR			
First Quarter		Second Quarter	
FY 540	For. Econ. ....4	FY 541	For. Mgt. & Admin. ....4
FY 520	Silviculture ....5	FY 480	For. Prob. I. ....0
	Electives ....8	FY 499	Honors Project ....2-5
			Electives ....6-9

Third Quarter	
FY 481	For. Prob. II ....4
	Electives14

TOTAL — 210 QUARTER HOURS

*At least one elective course must be chosen from the humanities.

Twenty-five of the free elective hours are to be chosen under the supervision of the faculty adviser, so as to develop a distinct program leading to a pre-determined goal.

Forest Products (FP)†

FRESHMAN YEAR			
First Quarter		Second Quarter	
EH 101	English Comp. ....3	EH 102	English Comp. ....3
HY 101	World History ....3	HY 102	World History ....3
MH 161	An. Geom. & Cal. ....5	MH 162	An. Geom. & Cal. ....5
BI 101	Prin. of Biology ....5	BI 102	Plant Biology ....5
PE	or Elective ....1	PE	or Elective ....1
	ROTC or Elective ....1		ROTC or Elective ....1

Third Quarter	
EH 103	English Comp. ....3
HY 103	World History ....3
MH 163	An. Geom. & Cal. ....5
CH 103	Fund. of Chemistry ....4
CH 103	Lab. ....1
PE	or Elective ....1
	ROTC or Elective ....1

SOPHOMORE YEAR			
CH 104	Fund. of Chemistry ....4	CH 203	Organic Chemistry ....5
CH 104	Lab. ....1	PS 205	Intr. to Physics ....5
MH 264	An. Geom. & Cal. ....5	EC 202	Economics II* ....5
EC 200	Economics I ....5	IE 204	Computer Prog. ....3
SC 202	Appl. Speech Com. ....3		ROTC or Elective ....1
	ROTC or Elective ....1		

JUNIOR YEAR			
ACF 212	Prin. of Acct. II ....4	FP 330	Solid Wood Products ....3
FP 206	Wood Measurement ....3	FP 478	Intr. to Wood Chem. ....3
IE 323	Eng. Statistics II ....5	FP 474	Wood Gluing & Coating ....3
IE 320	Eng. Economy ....5	IE 333	Eng. Statistics II ....4
		ME 205	Statics ....4

SENIOR YEAR			
EHA 304	Tech. Writing ....3	FP 531	Mech. Prop. of Wood ....4
FP 525	Phys. Prop. of Wood ....3	FP 533	Wood Drying Proc. ....3
FP 532	Deterioration & Wood Treating Processes ....3	FP 536	For. Prod. Mktg. ....3
MN 442	Personnel Mgt. ....5	FP 590	Seminar ....1
	Electives ....3		Electives ....4

ACF 310	Managerial Cost & Budgeting ....4
ACF 360	Prin. of Business Finance ....5
FP 475	Wood-Based Panel Technology ....3
IE 335	Linear Programming ....4
MN 310	Prin. of Management3

TOTAL—210 QUARTER HOURS

†Students anticipating advanced study in Wood Science may petition for permission to take alternative courses appropriate to the students goals.

*AEC 202 and AEC 206 sequence may be taken instead of EC 200 and EC 202.

Landscape And Ornamental Horticulture (OH)

The Landscape and Ornamental Horticulture curriculum provides professional and basic knowledge and develops basic skills in four areas: Florist Crop Production, Landscape Design, Nursery Crop Production, and Retail Flower Shop Management. By the end of the sophomore year the student will choose one of these areas as his major option, and will schedule the courses prescribed for that option in the junior and senior years.

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
BI	101	Prin. Biology.....5	BI	102	Plant Biology.....5	CH	104	Fund. Chem. & Lab.....5
MH	160	Pre-Cal w. Trig.....5	CH	103	Fund. Chem. & Lab*.....5	MH	161	An. Geom. & Cal.....5
EH	101	English Comp.....3	EH	102	English Comp.....3	EH	103	English Comp.....3
HF	101	Intr. Hort.....1	HY	101	World History.....3	HY	102	World History.....3
PE		ROTC or Elective.....1	PE		ROTC or Elective.....1	PE		ROTC or Elective.....1
PE		or Elective.....1	PE		or Elective.....1	PE		or Elective.....1

SOPHOMORE YEAR

BI	103	Animal Biology.....5	AEC	202	Ag. Economics I.....5	CH	207	Organic Chem. & Lab.....5
HF	224	Plant Propagation.....5	SY	201	Intr. to Sociology.....5	HF	221	Landscape Gardening.....5
SC	211	Public Speaking.....5			ROTC or Elective.....1			ROTC or Elective.....1
HY	103	World History.....3			Electives.....5			Electives.....5
		ROTC or Elective.....1						

JUNIOR YEAR

54 hours in selected option to be arranged in consultation with adviser.

SENIOR YEAR

53 hours in selected option to be arranged in consultation with adviser.

TOTAL HOURS REQUIRED—210 QUARTER HOURS

*Students not qualified to take CH 103 will take CH 101 in first quarter and will take CH 102 and CH 103L in their second quarter.

ADDITIONAL COURSES TO BE TAKEN BY ALL OPTIONS

AY	304	General Soils.....5	BY	506	Systematic Botany.....5
AY	502	Soil Fertility or AY 506 Fertilizers & Soil Testing.....5	EH	390	Advanced Composition.....5
BY	306	Plant Physiology.....5	HF	323	Ghse. Environ. Control.....5
BY	309	Plant Pathology.....5	ZY	502	Economic Entomology.....5

REQUIRED ELECTIVES FOR VARIOUS OPTIONS**Florist Crop Production**

Objective: To train students in production, marketing and management of floricultural crops.

The following courses, with credit hours shown, are required: ACF 211-Prin. of Acct.-4, HF 225-Flower Arranging-3, HF 308-Vegetable Crops-5, HF 522-Fund. of Floricultural Crop Prod.-5, HF 425-Flower Shop Management-5, MN 310-Prin. of Management-3, ZY 300-Genetics-5, MT 241-Business Law-4 or MT 255-Legal and Social Environment of Business-4.

Landscape Design

Objective: To train students in the principles and practices of Landscape Design.

The following courses, with credit hours shown, are required: LA 321-Basic LA Design-5, LA 322-Basic Landscape Architectural Design-5, HF 521-Care and Maint. Orn. Plants-5, MT 241-Business Law-4 or MT 255-Legal and Social Environment of Business-4, AY 315-Turfgrass Mgt.-5, HF 222-Trees-5, HF 223-Evergreen Shrubs and Vines-5, HF 321-Deciduous Shrubs and Vines-5; and five hours to be selected from the following areas: AN 350-Soil and Water Technology-5, HF 523-Nursery Mgt.-5, GL 101-Intr. Geology-5, AT 122-Fund.-5.

Nursery Crop Production

Objective: To train students in production, marketing, and management of nursery products.

The following courses, with credit hours shown, are required: AY 315 Turfgrass Mgt.-5, HF 201-Orchard Management-5, HF 521-Care & Maint. Orn. Plants-5, HF 523-Nursery Mgt.-5, ZY 300-Genetics-5; ten hours to be selected from the following 3 courses: HF 222-Trees-5, HF 223-Evergreen Shrubs & Vines-5, HF 321-Deciduous Shrubs & Vines-5; and 4 hrs. to be selected from the following 3 courses: ACF 211-Prin. of Acct.-4, MT 241-Business Law-4, or MT 255-Legal and Social Environment of Business-4.

Retail Flower Shop Management

Objective: To train students to be managers of retail flower shop operations. Both art and business management are involved.

The following courses, with credit hours shown, are required: EC 202-Economics II-5 or AEC 206-Ag. Economics II-5, ACF 211-Prin. of Acct.-4, HF 225-Flower Arranging-3, HF 522-Floricultural Crop Prod.-5, HF 425-Flower Shop Management-5, MN 310-Prin. of Management-3, MT 241-Business Law-4 or MT 255-Legal and Social Environment of Business-4, MT 331-Prin. of Marketing-3, MT 333-Merchandising Management-5.

OTHER ELECTIVES

Additional electives to make a total of 210 hours in a given option are to be selected with the approval of the adviser and dean.

Plant Protection (PLP)

Plant protection, an interdepartmental curriculum, is designed for those undergraduate students interested in the protection of man's crops from diseases, insects, weeds, nematodes, and other pests. Students may utilize their electives to emphasize their special interest in protection of crops from one group of pests listed above.

First Quarter			FRESHMAN YEAR			Third Quarter		
BI	101	General Biology.....5	BI	102	Plant Biology.....5	BI	103	Animal Biology.....5
CH	103	Fund. Chem. & Lab.....5	CH	104	Fund. Chem. & Lab.....5	MH	162	An. Geom. & Cal.....5
MH	160	Pre-Cal. & Trig.....5	MH	161	An. Geom. & Cal.....5	CH	207	Organic Chem. & Lab.....5
PE		or Elective.....1	PE		or Elective.....1	PE		or Elective.....1
		ROTC or Elective.....1			ROTC or Elective.....1			ROTC or Elective.....1
Second Quarter			SOPHOMORE YEAR					
ZY	300	Genetics.....5	AEC	202	Ag. Economics.....5	BY	306	Plant Physiology.....5
PS	205	Intr. Physics.....5	AY	304	General Soils.....5	BY	300	Microbiology.....5
EH	101	English Comp.....3	EH	102	English Comp.....3	EH	103	English Comp.....3
HY	101	World History.....3	HY	102	World History.....3	HY	103	World History.....3
		ROTC or Elective.....1			ROTC or Elective.....1			ROTC or Elective.....1
Third Quarter			JUNIOR YEAR					
ZY	304	General Entomology.....5	AY	200	Crop Prod.....5	BY	or	AY 321 Herb. Action.....3
BY	309	Gen. Plant Pathol.....5	BY	550	Meth. Plant Path.....3	BY	552	Soil-Seed Diseases.....4
SC	202	App. Sp. Comm.....3	AY, BY		or ZY 403	ZY	405	Applied Entomology.....5
		Elective.....5			Pesticides.....5	BY	320	Weed ID and Ecol.....3
					Elective.....5			Elective.....3
Fourth Quarter			SENIOR YEAR					
AY	312	Princ. Weed Sci.....5	AY	422	Fact. Limiting	AY, BY	or	ZY 407
BY	551	Fol. Har. Stor. Disease.....3			Crop Prod.....3			Concepts of Pest
ZY	406	Insect Pest Mgt.....5	ZY	306	Prin. of Ecology.....5			Management.....5
AY	399	Prob. Weed Sci.....1			Electives.....9			Electives.....13
		Elective.....5						

TOTAL—210 QUARTER HOURS

Each student must select 20 hours of approved electives in one area of concentration.



School of Architecture and Fine Arts

E. KEITH MCPHEETERS, *Dean*
WARREN D. HOCKMAN, *Assistant Dean*

THE SCHOOL OF ARCHITECTURE AND FINE ARTS includes the Departments of Architecture, Art, Building Science, Industrial Design, Music and Theatre.

The Departments of Architecture and Building Science offer undergraduate degree curricula in Architecture, Interior Design, Landscape Architecture, and Building Science. The objective of these programs is to educate professional practitioners for many aspects of the designed physical environment.

The Departments of Art, Industrial Design, Music and Theatre offer curricula in those disciplines. The Departments of Art, Music, and Theatre cooperate with the School of Education in the education of teaching professionals. The objective of these programs is to develop creative and professionally knowledgeable practitioners and teachers in the arts and to provide a foundation for continuing professional development.

Graduate degrees are offered in Art, Music, Industrial Design, and Regional Planning. For details see the *Graduate School Bulletin*.

Department Of Architecture

The Department of Architecture was established in 1907 and is the oldest in the South. Courses are offered leading to the non-professional degree Bachelor of Science and the professional degree Bachelor of Architecture, (Architectural Design Option or Architectural Management Option), Bachelor of Landscape Architecture, Bachelor of Interior Design, and Master of Regional Planning.

Admission

Acceptance for admission to the professional curricula in architecture, landscape architecture, regional planning, and interior design, will be determined on the basis of an evaluation of the candidate's test scores and academic records. These standards are in addition to those General Admission Requirements of Auburn University.

Transfer

Transfer students from non-architectural programs will be required to begin the Design sequence at AR 110. Transfer students from accredited schools of Architecture will be required to present examples of their work for evaluation by the Design Co-ordinators Committee. The Committee will determine the level at which the student will enter the Design Sequence.

Design Course Standards and Policies

All design courses must be taken in sequence. Any student receiving a grade below "C" in AR 201, 202, or 203 shall be reviewed at the end of the second year for a decision on continuation in the design program. Any student in design above the second year level who receives a grade below "C" on the second attempt in a design course will be subject to being dropped from the program.

All required lower division (first and second year) course work must be completed prior to entry into the third year of design. Likewise, all required upper division (third and fourth year) course work must be completed prior to entry into the fifth year of design.

Student work will be retained by the Department for indefinite periods to be used for exhibition or for record and accreditation purposes. Return of work is at the discretion of the Department.

The Cooperative Education Program is also offered. For more information, refer to page 46. The Department also offers a one quarter study abroad program for qualified "B" average or above students.

Architecture

The Curriculum in Architecture prepares the student to take his place as a citizen and as a professional. Since the building industry is one of the three largest in the nation in terms of expenditure and employment, the architect today must accept a concern for the improvement of the physical design of the environment and assume the leadership in evolving effective procedures toward this end. The architect must bring to his work technical knowledge, social insight, creative imagination, and individual integrity. Each student, therefore, must declare and pursue a double minor (30 hrs.) or two minor (15 hrs.) fields of study in order to develop depth of knowledge from elective course work.

The Bachelor of Science (a non-professional degree) may be awarded upon successful completion of the first four years of the curriculum in Architecture with the special approval of the Department Head and the Dean. The Bachelor of Architecture (the professional degree) is awarded upon completion of the fifth year in either the Architectural Design or Architectural Management options.

The Department is a member of the Association of Collegiate Schools of Architecture, and the curriculum in Architecture is accredited by the National Architectural Accrediting Board. The Architecture curriculum prepares the student for the office experience and the examination required by the registration laws to practice architecture as well as for examination by the National Council of Architectural Registration Boards.

The Department strongly recommends summer employment in a professional office and encourages student participation in the internship development program sponsored by NCARB and the AIA. Participation in this program after completing third year design permits internship credit for professional licensing.

Curriculum in Architecture (AR)

First Year			FIRST YEAR			Third Quarter		
First Quarter			Second Quarter					
AR 110	Design Fund.	5	AR 111	Design Fund.	5	AR 112	Design Fund.	5
MH 160	Pre. Cal. w/Trig	5	MH 161	An. Geom. & Cal.	5	MH 162	An. Geom. & Cal. **	5
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
HY	Elective*	3	HY	Elective*	3	HY	Elective	3
	Elective	1		Elective	1		Elective	1

FIRST QUARTER			SECOND YEAR			THIRD QUARTER		
AR 201	Arch. Design	5	AR 202	Arch. Design	5	AR 203	Arch. Design	5
PS 205	Intr. Physics I	5	PS 206	Intr. Physics II	5	BSC 211	Mech. of Structures	5
AR 261	Hist. & Theo. Arch.	3	BSC 304	Constr. Systems	3	BSC 202	Matrils. of Const.	5
	Elective	5	AR 262	Hist. & Theo. Arch.	3	AR 263	Hist. & Theo. Arch.	3
THIRD YEAR			FOURTH YEAR					
AR 301	Arch. Design	5	AR 302	Arch. Design	5	AR 303	Arch. Design	5
BSC 311	Strgth. of Matl.	5	BSC 314	Reinf. Concrete	5	BSC 315	Applied Struc.	5
AR 350	20th Century Arch.	3	BSC 452	Building Equip. I	3	BSC 453	Building Equip. II	3
	Elective***	2		Elective	6		Elective	3
BSC 451	Bldg. Energy	3						
AR 401	Arch. Design	5	AR 402	Arch. Design	5	AR 403	Arch. Design	5
MN 310	Prin. Manag.	3	AR 475	Urban Design	3	EHA 304	Technical Writing	3
AR 474	Intr. Urb. Plan.	3	AR	Seminar	3	AR	Seminar	3
	Elective***	7		Elective***	3		Elective***	3
				Elective***	3		Elective***	3

BACHELOR OF SCIENCE**TOTAL—208 QUARTER HOURS**

*History Electives shall follow a sequence and may be chosen from the following: World History (HY 101, 102, 103), or Technology and Civilization (HY 204, 205, 206).

**MH 162, ACF 215 Fund. of Gen. and Cost Accounting (5) or departmentally approved substitution.

***See Bulletin for University elective requirements.

Six hours of Basic ROTC and six hours of Advanced ROTC may be substituted for 12 hours of general electives. One seminar will be chosen from each of four of the following categories. Consult department for specific offerings in each category.

- AR 451 Seminars in Methods and Process
- AR 452 Seminars in Contemporary Issues
- AR 453 Seminars in Interdisciplinary Studies
- AR 456 Seminars in Historical Perspectives
- AR 457 Seminars in Aspects of Design
- AR 458 Seminars in Disciplines of Environmental Design

ARCHITECTURAL PROFESSIONAL OPTIONS**Architectural Design Option**

FIRST QUARTER			FIFTH YEAR			THIRD QUARTER		
AR 465	Arch. Design	8	AR 466	Arch. Design	8	AR 467	Arch. Design	8
AR 471	Prof. Practice	3	AR 499	Design Research	2	AR	Seminar	3
AR	Elec. or AR Seminar	3	AR 472	Prof. Practice	3		Elective	5
AR	Seminar	3		Elec. or AR Seminar	3			

BACHELOR OF ARCHITECTURE**TOTAL—257 QUARTER HOURS****ARCHITECTURAL MANAGEMENT OPTION**

AR 485	Arch. Manag.	5	AR 486	Arch. Manag.	5	AR 487	Arch. Manag.	8
AR 472	Prof. Practice	3	MT 255	Legal Env. of Business	4	AR	Seminar	3
MT 241	Bus. Law I	4	MN 346	Org. Behavior	4		Elective	3
AR	Seminar	3	AR 472	Prof. Practice	3		Elective	2
AR 499	Design Research	2						

BACHELOR OF ARCHITECTURE**TOTAL—257 QUARTER HOURS****Interior Design**

The curriculum in Interior Design seeks to prepare the student to take his place as a professional specialist in the design of interior space. As such, he expects to assume a responsible role among those who shape the physical environment. His primary interest in the development of the interiors lies with the social, historical and technical implications of the development of interior space, surface and material.

Curriculum in Interior Design (ID)

FIRST YEAR			FIRST YEAR			FIRST YEAR		
First Quarter			Second Quarter			Third Quarter		
AR 110	Design Fund.	5	AR 111	Design Fund.	5	AR 112	Design Fund.	5
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
AT 171	Hist. World Art	3	AT 172	Hist. World Art	3	AT 173	Hist. World Art	3
MH 140	College Algebra	5	MH 161	An. Geom. & Cal.*	5	PG 211	Psychology	5
	Elective	1		Elective	1		Elective	1
SECOND YEAR			SECOND YEAR			SECOND YEAR		
AR 201	Arch. Design	5	AR 202	Arch. Design	5	AR 203	Arch. Design	5
ID 215	Elements of I.D.	3	ID 216	Elements of I.D.	3	ID 217	Elements of I.D.	3
AR 261	Hist. & Theo. Arch.	3	AR 262	Hist. & Theo. Arch.	3	AR 263	Hist. & Theo. Arch.	3
	Nat. Sci. Elective	5		Nat. Sci. Elective	5	SY 201	Sociology	5
			EH 304	Tech. Writing**	3			
THIRD YEAR			THIRD YEAR			THIRD YEAR		
ID 305	Interior Design	5	ID 306	Interior Design	5	ID 307	Interior Design	5
ID 365	Period Int.	5	ID 366	Period Interiors	5	ID 367	Contemp. Int.	5
AR 469	Lighting	3	MN 310	Prin. Manag.	5	ID 495	Special Probs.	3
AR 350	20th Century Arch.	3	BSC 304	Constru. Systems	3		Elective	3
	Elective	3						
FOURTH YEAR			FOURTH YEAR			FOURTH YEAR		
ID 405	Interior Design	5	ID 406	Interior Design	5	ID 407	Int. Design (Thesis)	7
ID 441	Prof. Prac.	3	ID 408	Int. Design Res.	2		Elective	5
	Elective	5		Creative Crafts,			Elective	3
	Elective	5		Textile Design, Weaving,				
				or Photography	3			
			ID 442	Prof. Prac.	3			
				Elective	5			

BACHELOR OF INTERIOR DESIGN

TOTAL—206 QUARTER HOURS

*MH 161 or ACF 215 Fund. of Gen. and Cost Accounting (5).

**EH 304 or SC 202 Appl. Speech Comm. (3) or SC 211 Public Speaking (5).

AT 371, 372, or 373, Art History may be substituted for AT 171, 172 or 173.

Two months of practical experience with a professional interior designer is recommended between the third and fourth year.

Six hours of Basic ROTC and six hours of Advanced ROTC may be substituted for 12 hours general electives.

Landscape Architecture

Landscape Architecture is the planning and design of land and water for optimum human use and enjoyment. In its growth, the profession has evolved to include a wide range of activities from a strong involvement with small scale physical design to the need for regional scale environmental analysis and natural resource planning.

Sound preparation for a career in Landscape Architecture requires a thorough professional education, therefore, the curriculum draws from the realms of Nature and Man, Art, and Technology for its strength. The curriculum addresses itself to the Landscape Architect's role in understanding and balancing the relationship between human enterprise and the natural environment.

The Bachelor of Science degree (a non-professional degree) may be awarded upon successful completion of the first four years of the curriculum in Landscape Architecture with the special approval of the Department and the Dean. The Bachelor of Landscape Architecture degree (the professional degree) is awarded upon the successful completion of the fifth year of study. The total curriculum prepares the student for professional practice, as well as for the national and state registration examinations.

Curriculum in Landscape Architecture (LA)

FIRST YEAR			FIRST YEAR			FIRST YEAR		
First Quarter			Second Quarter			Third Quarter		
AR 110	Design Fund.	5	AR 111	Design Fund.	5	AR 112	Design Fund.	5
MH 160	Pre Cal. w/Trig	5	MH 161	An. Geom. & Cal.	5	CE 201	Surveying	5
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
HY 101	World History*	3	HY 102	World History*	3	HY 103	World History*	3
	Elective	1		Elective	1		Elective	1

FIRST YEAR			SECOND YEAR			THIRD YEAR		
First Quarter			Second Quarter			Third Quarter		
AR 201	Arch. Design	5	AR 202	Arch. Design	5	AR 203	Arch. Design	5
LA 231	Intr. Land. Arch.	3	LA 232	Dev. Land. Arch. I	3	LA 233	Dev. Land. Arch. II	3
BI 101	Prin. of Biology	5	BI 102	Plant Biology	5	HF 321	Decid. Sh. & Vines	5
HF 222	Trees	5	HF 223	Everg. Sh. & Vines	5	GY 214	Phys. Geog.	5
THIRD YEAR			FOURTH YEAR					
LA 321	Basic L.A. Design	5	LA 322	Basic L. A. Design	5	LA 323	Basic L. A. Design	5
PS 205	Physics	5	LA 341	Lands. Const. I	5	LA 342	Lands. Const. II	5
SY 201	Intr. Sociology**	5	EC 206	Socio-Economics	3	PG 211	Psychology	5
	Elective	3		Elective	3	EHA 304	Tech. Writing	3
LA 421	Int. Lands. Design	5	LA 422	Int. Lands. Design	5	LA 423	Int. Lands. Design	5
SC 401	Psych. of Commun.	5	LA 431	Adv. Plant. Comp.	5	LA 446	Prof. Practice I	5
AR 474	Intr. Urb. Plng.	3	AR 475	Urban Design	3	LA 495	Special Problems	3
	Elective	3		Elective	3		Elective	3
BACHELOR OF SCIENCE			BACHELOR OF LANDSCAPE ARCHITECTURE					
TOTAL—205 QUARTER HOURS			TOTAL—253 QUARTER HOURS					
FIFTH YEAR								
LA 451	Adv. Lands. Design	8	LA 452	Adv. Lands. Design	8	LA 453	Adv. Lands. Design	8
LA 447	Prof. Practice II	3	LA 450	Design Research	2	LA 455	Lands. Arch. Seminar	5
	Elective	5		Elective	3		Elective	3
				Elective	3			

*HY 101, 102, 103 or Technology and Civilization (HY 204, 205, 206).

** SY 201 or Rural Sociology (RSY 261).

Department Of Art

The Visual Arts curriculum trains students to become professional practitioners as graphic designers, illustrators, advertising artists, art directors, painters, sculptors, printmakers, etc. It leads to the Bachelor of Fine Arts degree, and its program of studio courses is combined with studies of the function and historical background of the visual arts. Courses in general education promote in students a comprehension of their responsibilities to their society and culture. A sound program of fundamental courses in drawing, design, painting, and three-dimensional expression precede advanced courses in which students work with a maximum of independence under the guidance of qualified instructors.

The Visual Arts curriculum may be divided into three general categories: academic courses, studio courses and courses in art history. Studio courses are divided into three progressive group levels. The first year is made up of visual art fundamentals. The second and third years contain classes in basic traditional media in which the student learns technical procedures and develops the disciplines necessary to express himself fully in the third and fourth year areas of concentration. The third and fourth year areas include drawing, painting, printmaking, sculpture, visual design and illustration.

The Visual Communications program gives fundamental training in the techniques of graphic design and related areas of visual communication. It is strongly reinforced with courses in painting, drawing, printmaking, sculpture and art history. Students preparing themselves as practicing artists or artist-teachers may concentrate entirely upon the offerings in the traditional fine arts media. Students planning to teach at the college level need to secure a Master of Fine Arts degree at this or another institution.

The department also offers courses for education majors specializing in art, and for students in other fields who seek general knowledge and appreciation of the visual arts. Students in the School of Arts and Sciences may elect a minor (15 hours), a double minor (30 hours), or B.A. with art major (See page 85).

The Department of Art is an accredited member of the National Association of Schools of Art, and a member of the College Art Association.

Transfer

All course work to be considered for transfer credit should be the equivalent of work required in the Visual Arts curriculum at Auburn. Art studio course credit earned (C or better) will be considered for advanced standing if a complete portfolio of work is submitted to the Auburn Art Department for evaluation. If the examples do not approximate Auburn's requirements, then credit may be given for an art studio elective. If the quality of work is not acceptable, credit may be given for an open elective. Transfer students are advised that their degree may require more than a total of four years because of the professional nature of Auburn's curriculum, the sequential arrangement of its courses, and unusually heavy demands for enrollment.

Graduate Study in Fine Arts

Students who hold the degree of Bachelor of Fine Arts, or a similar degree, are eligible to apply to the Dean of the Graduate School for admission to the graduate program leading to the Master of Fine Arts degree. For details examine the *Graduate School Bulletin*.

Curriculum in Visual Arts (VAT)

FIRST YEAR			
First Quarter		Second Quarter	
AT 111	Fundamentals.....5	AT 112	Fundamentals.....5
AT 121	Fundamentals.....5	AT 122	Fundamentals.....5
AT 171	Hist. of World Art.....3	AT 172	Hist. of World Art.....3
EH 101	English Comp.....3	EH 102	English Comp.....3
Third Quarter			
AT 113	Fundamentals.....5	AT 123	Fundamentals.....5
AT 173	Hist. of World Art.....3	AT 173	Hist. of World Art.....3
EH 103	English Comp.....3	EH 103	English Comp.....3
SECOND YEAR			
First Quarter		Second Quarter	
AT	Group A Studio.....5	AT	Group A Studio.....5
AT	Group A Studio.....5	AT	Group A Studio.....5
	Natural Science.....5		Natural Science.....5
	Math/Philosophy.....3		Math/Philosophy.....3
Third Quarter			
AT	Group A Studio.....5	AT	Group A Studio.....5
AT	Group A or B Studio.....5	AT	Group A or B Studio.....5
	Natural Science.....5		Natural Science.....5
AT	Group I AT HY.....3	AT	Group II AT HY.....3
THIRD YEAR			
First Quarter		Second Quarter	
AT	Group A Studio.....5	AT	Group A Studio.....5
AT	Group A or B Studio.....5	AT	Group A or B Studio.....5
	Natural Science.....5		Nat. or Soc. Sci.....5
AT	Group I AT HY.....3	AT	Group II AT HY.....3
FOURTH YEAR			
First Quarter		Second Quarter	
AT	Group B Studio.....5	AT	Group B Studio.....5
AT	Group A or B Studio.....5	AT	Group A or B Studio.....5
AT	Elective.....5	AT	Elective.....5
	Elective.....3		Elective.....3
Third Quarter			
AT	Group B Studio.....5	AT	Group B Studio.....5
AT	Group A or B Studio.....5	AT	Group A or B Studio.....5
	Natural Science.....5		Nat. or Soc. Sci.....5
AT	Group I AT HY.....3	AT	Group II AT HY.....3
TOTAL—210 QUARTER HOURS			

Six hours of Basic and six hours of Advanced ROTC may be scheduled in lieu of 12 hours of general electives.

GROUP A STUDIO

Prerequisites: AT 113, 123, 171, 172, and 173 (or by special permission).

Figure Drawing			Visual Communications		
AT 211	Basic Figure Drawing	AT 221	Graphic Processes	AT 321	Photodesign
AT 212	Figure Construction	AT 222	Design Systems	AT 322	Photocommunication
AT 213	Figure Drawing	AT 223	Graphic Formats	AT 323	Typographics
Painting			Printmaking		
AT 231- 331	Oil Painting	AT 241- 341	Relief Printmaking	AT 251- 351	Clay Sculpture
AT 232- 332	Transp. Wtr. Color	AT 242- 342	Intaglio Printmaking	AT 252- 352	Wood Sculpture
AT 233- 333	Opaque Wtr. Color	AT 243- 343	Planographic Printmaking	AT 253- 353	Stone Sculpture

GROUP B STUDIO

Areas of concentration are followed by their prerequisites.

AT 424, 425-426	Visual Design 1, 2, 3	2.0 Average in 200-level Drawing and Visual Comm.
AT 434, 435-436	Advanced Painting/Drawing 1, 2, 3	2.0 Average in 200-level Drawing and Painting
AT 444, 445-446	Advanced Printmaking 1, 2, 3	2.0 Average in 200-level Drawing and Printmaking
AT 454, 455-456	Advanced Sculpture 1, 2, 3	2.0 Average in 200-level Drawing and Sculpture
AT 464, 465-466	Illustration 1, 2, 3	2.0 Average in 200-level Drawing and Visual Comm.

ART HISTORY

Prerequisite: Sophomore Standing.

Group I		Group II		Group III	
AT 371	Ancient Egyptian & Near Eastern Art.....3	AT 374	Gothic Art.....3	AT 377	Baroque & Rococo Art.....3
AT 372	Ancient Greek and Roman Art.....3	AT 375	Ital. Renais. Art.....3	AT 378	Early Mod. Art.....3
AT 373	Medieval Art.....3	AT 376	Late Renais. & Mannerist Art.....3	AT 379	Late Mod. Art.....3

Department Of Building Science

The purpose of the curriculum in Building Science is to develop professionally knowledgeable practitioners and managers for a wide variety of roles in the construction industry.

The Department of Building Science offers courses in structural and mechanical systems for buildings, construction procedures, cost estimation and construction management. The curriculum leads to the degree of Bachelor of Science in Building Construction.

Acceptance for admission will be determined on the basis of an evaluation of the candidate's test scores and academic records. Students may transfer into the program from another college or university if they have attained an overall grade point average of at least C+ and have completed MH 161 Analytic Geometry and Calculus or the equivalent with a satisfactory grade.

Curriculum in Building Science (BSC)**FIRST YEAR**

First Quarter		Second Quarter		Third Quarter	
MH 160	Pre-Cal. w. Trig.....5	MH 161	An. Geom. & Cal.....5	MH 162	An. Geom. & Cal.***.....5
BSC 100	Drawing & Proj.....2	BSC 101	Intr. to Building.....4	BSC 202	Mtls. of Constr.....5
EH 101	English Comp.....3	EH 102	English Comp.....3	EH 103	English Comp.....3
HY 204	Tech. & Civil.....3	HY 205	Tech. & Civil.....3	HY 206	Tech. & Civil.....3
	Electives**.....2		Electives**.....2		Elective**.....1

SECOND YEAR

EC 200	Gen. Economics.....5	BSC 211	Mech. of Struct.....5	BSC 311	Strength of Mtls.....5
PS 205	Physics.....5	PS 206	Physics.....5	ACF 212	Intr. Acct.....4
BSC 261	Hist. of Bldg. I.....3	ACF 211	Intr. Acct.....4		Computer Elective.....3
SC 202	App. Sp. Comm.....3	BSC 262	Hist. of Bldg. II.....3		Elective†.....5

THIRD YEAR					
First Quarter		Second Quarter		Third Quarter	
BSC 314	Reinforced Concrete.....5	BSC 315	Appl. Struct.....5	BSC 321	Constr. Estim. I.....5
BSC 304	Constr. Systems.....3	BSC 323	Fdnatns. & Soils.....3	MN 500	Ind. Relations.....5
BSC 324	Constr. Surveying.....3	EGR 491	Leg. Asp. Engr.....3	BSC 340	Constr. Safety.....3
EHA 304	Tech. Writing.....3		Arch. & Design.....3	BSC 452	Bldg. Equip. I.....3
	Elective†.....5		Tech. Electives.....8	BSC 325	Formwk. Design.....3
FOURTH YEAR					
BSC 405	Contracting Bus. I.....3	BSC 434	Constr. Schldg.....5	BSC 490	Terminal Project.....8
BSC 431	Constr. Estim. II.....3	BSC 406	Contracting Bus. II.....3		Tech. Elective.....5
BSC 453	Bldg. Equip. II.....3		Tech. Electives.....11		
	Electives†.....10				

TOTAL—207 QUARTER HOURS

*HY 101, 102, 103 may be substituted for HY 204, 205, 206.

**Physical Education, Basic ROTC, or other elective.

***CH 101, 102, 103L may be substituted for MH 162.

†See Bulletin for university elective requirements.

BSC course numbers with a zero in the middle (101, 202, etc.) are core courses for BSC students and must be taken in sequence.

Technical Electives must be selected from lists approved by the Department. Six hours of Basic ROTC and six hours of Advanced ROTC may be substituted for SC 202 and 9 hours of general electives.

Department of Industrial Design

Industrial Design is concerned primarily with the practical and aesthetic relation of products and systems to those who use them. The Industrial Designer is responsible for the product's shape, color, proportion, and texture, or for the optimum interaction between man and technology in a system. He is deeply concerned with such factors of use as efficiency, convenience, safety, comfort, maintenance, and cost.

The Industrial Designer's activity encompasses areas such as product design, transportation design, package design, exhibition design, and systems design.

The student of Industrial Design learns, for example, the basic principles of design, engineering, human factors designing, marketing, and sociology. He acquires such technical skills as drafting, model-making, photography and sketching techniques. He is introduced to design methods, product planning, visual statistics, materials, manufacturing methods, consumer psychology, and environmental studies.

The four-year curriculum leads to the professional degree of Bachelor of Industrial Design. The program is approved by the Industrial Designers Society of America. Graduates will qualify for positions in industrial design consultant offices and in various industries.

Students failing to meet grade standards listed under industrial design course descriptions will be suspended from taking IND courses for one year.

A Cooperative Education Program is also offered. (See Cooperative Education section.)

Curriculum in Industrial Design (IND)

FRESHMAN YEAR					
First Quarter		Second Quarter		Third Quarter	
MH 140	College Algebra.....5	MH 161	An. Geom. & Cal.....5	BI 101	Prin. of Biology.....5
EH 101	English Comp.....3	EH 102	English Comp.....3	EH 103	English Comp.....3
HY 204	Tech. & Civilization.....3	HY 205	Tech. & Civilization.....3	HY 206	Tech. & Civilization.....3
TS 102	Graphic Comm. & Des. 2	TS 104	Desr. Geometry.....2	TS 105	Engr. Drawing II.....2
TS 100	Intr. Mfg. Process.....2	TS 112	Welding Science.....1	TS 216	Plastics Tech.....2
		TS 111	Woodworking.....1		Elective.....1
			Elective.....1		

SOPHOMORE YEAR

First Quarter			Second Quarter			Third Quarter		
IND 210	Industrial Design	6	IND 211	Industrial Design	6	IND 212	Industrial Design	6
IND 221	Materials & Tech.	5	IND 222	Tech. Illustration	5	IND 223	Ind. Design Met.	5
	Elective	3	EC 202	Economics II	5	PS 200	Fnds. of Physics	5
PG 212	Psychology	5		Elective	3	TS 204	Kinematics of Mach.	3
JUNIOR YEAR								
IND 310	Industrial Design	6	IND 311	Industrial Design	6	IND 312	Industrial Design	6
IND 309	Design Comm.	5	IND 308	Design Workshop	5	IND 307	Anthropometry	5
EHA 304	Tech. Writing	3		Elective	5	MT 331	Prin. of Mkt.	5
	Elective	3	AT	Art History Elective	3		Elective	3
SENIOR YEAR								
IND 410	Industrial Design	6	IND 411	Industrial Design	6	IND 412	Ind. Design Thesis	6
IND 415	Hy. of Ind. Design	5	PG 565	Psycho. Des.	5	IND 585	Seminar in Ind. Des.	5
PG 561	Industrial Psych.	5		Elective	5	SY 508	Ind. Sociology	5

BACHELOR OF INDUSTRIAL DESIGN
TOTAL—207 QUARTER HOURS

Electives must come from the list of courses approved by the Department.

Six hours of Basic ROTC and six hours of Advanced ROTC may be substituted for 12 hours of general electives.

Students who hold a bachelor's degree are eligible to apply to the Dean of the Graduate School for admission to the graduate program leading to the Master of Industrial Design degree. For details see the *Graduate School Bulletin*.

Department Of Music

The Department of Music provides instruction and performing experience to students interested in developing their talents in music. The courses of study provided by the Department have been created to present a balance between creative skills and academic studies, allowing at the same time a certain flexibility to meet individual requirements.

The Department of Music offers the Music major a professional curriculum leading to the Bachelor of Music degree, with majors in (a) Performance, (b) Theory and Composition, (c) Church Music, or (d) Piano Pedagogy. These programs provide preparation for the professional field of performance and for private or college teaching of applied music, theory, and composition. They also provide training for church organists and choir directors.

For the student wishing to major in Music History and Literature, the Department of Music offers a program of studies leading to the Bachelor of Arts degree. This is a cultural, not a professional, degree.

Private instruction is available to all University students in band and orchestral instruments, voice, piano, and organ. Performance groups, such as the Marching and Concert Bands, Orchestra, University Singers, Concert Choir, Choral Union, Opera Workshop, and various instrumental ensembles, are also available to students in all curricula.

In each curriculum option six hours of Basic and six hours of Advanced ROTC may be scheduled in lieu of 12 hours of general electives.

Professional Curriculum in Music (MU)

(A) Performance Major

FIRST YEAR									
First Quarter			Second Quarter			Third Quarter			
MU 131	Mat. & Org. Music	5	MU 132	Mat. & Org. Music	5	MU 133	Mat. & Org. Music	5	
EH 101	English Comp	3	EH 102	English Comp	3	EH 103	English Comp	3	
HY 101	World History	3	HY 102	World History	3	HY 103	World History	3	
MU 181	Performance (major)	3	MU 182	Performance (major)	3	MU 183	Performance (major)	3	
MU 187	Performance (minor)	1	MU 188	Performance (minor)	1	MU 189	Performance (minor)	1	
	Elective	1	MU	Perf. Group	1	MU	Perf. Group	1	
MU 100	Convocation	0		Elective	1		Elective	1	
MU	Perf. Group	1	MU 100	Convocation	0	MU 100	Convocation	0	

SECOND YEAR

First Quarter		Second Quarter		Third Quarter	
MU 231	Mat. & Org. Music.....5	MU 232	Mat. & Org. Music.....5	MU 233	Mat. & Org. Music.....5
MU 281	Natural Science.....5	MU 282	Natural Science.....5	MH 100	Mathematics.....5
MU 287	Performance (major).....3	MU 288	Performance (major).....3	MU 283	Performance (major).....3
MU 287	Performance (minor).....3	MU 288	Performance (minor).....3	MU 289	Performance (minor).....1
MU	Perf. Group.....1	MU	Perf. Group.....1	MU	Perf. Group.....1
MU	Ensemble.....1	MU	Ensemble.....1	MU	Ensemble.....1
MU 100	Convocation.....0	MU 100	Convocation.....0	MU 100	Convocation.....0
			Elective.....3		Elective.....3

THIRD YEAR

MU 331	Mat. & Org. Music.....5	MU 332	Mat. & Org. Music.....5	MU 333	Mat. & Org. Music.....5
MU 361	Conducting.....3	PA 210	Philosophy.....3	PA 214	Philosophy.....3
MU 351	Music History.....3	MU 352	Music History.....3	MU 353	Music History.....3
MU 381	Performance (major).....3	MU 382	Performance (major).....3	MU 383	Performance (major).....3
MU	Ensemble.....1	MU	Ensemble.....1	MU 100	Convocation.....0
MU 100	Convocation.....0	MU 100	Convocation.....0		Elective (Social or
	Elective (Social or		Elective (Social or		Nat. Sci.).....3
	Nat. Science).....3		Nat. Sci.).....3		

FOURTH YEAR

FL	Foreign Language.....5	FL	Foreign Language.....5	FL	Foreign Language.....5
MU 481	Performance (major).....3	MU 482	Performance (major).....3	MU 483	Performance (major).....3
MU 337	Modern Harmony.....3	MU	Pedagogy.....3	MU	Ensemble.....1
MU	Ensemble.....1	MU	Ensemble.....1	MU 363	Conducting.....1
MU 100	Convocation.....0	MU 362	Conducting.....1	MU 100	Convocation.....0
	Elective (Social or	MU 100	Convocation.....0		Elective.....3
	Nat. Sci.).....6		Elective.....3		

TOTAL—205 QUARTER HOURS

(B) Theory and Composition Major

FIRST YEAR

First Quarter		Second Quarter		Third Quarter	
MU 131	Mat. & Org. Music.....5	MU 132	Mat. & Org. Music.....5	MU 133	Mat. & Org. Music.....5
EH 101	English Comp.....3	EH 102	English Comp.....3	EH 103	English Comp.....3
HY 101	World History.....3	HY 102	World History.....3	HY 103	World History.....3
MU 184	Performance.....1	MU 185	Performance.....1	MU 186	Performance.....1
MUT 116	Woodwind Instr.....1	MUT 117	Woodwind Instr.....1	MUT 118	Woodwind Instr.....1
MUT 110	String Instr.....1	MUT 111	String Instr.....1	MUT 112	String Instr.....1
	Elective.....1	MU	Perf. Group.....1	MU	Perf. Group.....1
MU 100	Convocation.....0	MU 100	Convocation.....0	MU 100	Convocation.....0
			Elective.....1		Elective.....1

SECOND YEAR

MU 231	Mat. & Org. Music.....5	MU 232	Mat. & Org. Music.....5	MU 233	Mat. & Org. Music.....5
MU 284	Natural Science.....5	PG 212	Psychology.....3	MH 100	Mathematics.....5
MUT 113	Brass Instr.....1	MU 285	Performance.....1	MU 286	Performance.....1
MU 107	Voice Class.....1	MUT 114	Brass Instr.....1	MU 115	Brass Instr.....1
	Social Science Elect.....3	MU 108	Voice Class.....1	MU 119	Percussion Instr.....1
MU	Perf. Group.....1	MU	Perf. Group.....1	MU	Perf. Group.....1
MU	Ensemble.....1	MU	Ensemble.....1	MU	Ensemble.....1
MU 100	Convocation.....0	MU 100	Convocation.....0	MU 100	Convocation.....0

THIRD YEAR

MU 331	Mat. & Org. Music.....5	MU 332	Mat. & Org. Music.....5	MU 333	Mat. & Org. Music.....5
MU 351	Music History.....3	MU 352	Music History.....3	MU 353	Music History.....3
MU 337	Modern Harmony I.....3	MU 338	Modern Harm. II.....3	MU 339	Modern Harm. III.....3
MU 437	Orchestration.....1	MU 438	Orchestration.....1	MU 386	Performance.....1
MU 384	Performance.....1	MU 385	Performance.....1	MU	Perf. Group.....1
MU	Perf. Group.....1	MU	Perf. Group.....1	MU 100	Convocation.....0
MU 100	Convocation.....0	MU 100	Convocation.....0	MU 439	Orchestration.....3
	Elective (Social or		Elective (Social or		Elective (Social or
	Nat. Science).....3		Nat. Science).....3		Nat. Science).....3

FOURTH YEAR

FL	Foreign Language.....5	FL	Foreign Language.....5	FL	Foreign Language.....5
MU 434	Music Comp.....3	MU 435	Music Comp.....3	MU 436	Music Comp.....3
MU 484	Performance.....1	MU 485	Performance.....1	MU 486	Performance.....1
MU	Perf. Group.....1	MU 445	Theory Pedagogy.....3	MU	Perf. Group.....1
MU 100	Convocation.....0	MU	Perf. Group.....1	MU 100	Convocation.....0
	Elective.....6	MU 100	Convocation.....0		Elective.....3
	Elective (Social or		Elective.....3		
	Nat. Science).....3				

TOTAL—206 QUARTER HOURS

(C) Church Music Major**FIRST YEAR****First Quarter**

MU 131	Mat. & Org. Music	5
EH 101	English Comp.	3
HY 101	World History	3
MU 181	Performance (major)	3
MU 187	Performance (minor)	1
MU	Ensemble	1
MU	Elective	1
MU 100	Convocation	0

Second Quarter

MU 132	Mat. & Org. Music	5
EH 102	English Comp.	3
HY 102	World History	3
MU 182	Performance (major)	3
MU 188	Performance (minor)	1
MU	Ensemble	1
MU	Elective	1
MU 100	Convocation	0

Third Quarter

MU 133	Mat. & Org. Music	5
EH 103	English Comp.	3
HY 103	World History	3
MU 183	Performance (major)	3
MU 189	Performance (minor)	1
MU	Ensemble	1
MU	Elective	1
MU 100	Convocation	0

SECOND YEAR**Natural Science**

MU 231	Mat. & Org. Music	5
MU 281	Performance (major)	3
MU 287	Performance (minor)	1
MU	Ensemble (or MU 211)	1
MU 100	Convocation	0
MU	Elective	3

MU 232	Mat. & Org. Music	5
MU 282	Performance (major)	3
MU 288	Performance (minor)	1
MU	Ensemble (or MU 212)	1
MU 100	Convocation	0
MU	Elective	3

MH 100	Mathematics	5
MU 233	Mat. & Org. Music	5
MU 283	Performance (major)	3
MU 289	Performance (minor)	1
MU	Ensemble	1
MU 100	Convocation	0
MU	Elective	3

THIRD YEAR

MU 331	Mat. & Org. Music	5
PA 210	Philosophy	3
MU 351	Music History	3
MU 381	Performance (major)	3
MU 312	Hymnology	3
MU	Ensemble	1
MU 100	Convocation	0

MU 332	Mat. & Org. Music	5
PA 214	Philosophy	3
MU 352	Music History	3
MU 382	Performance (major)	3
MU 311	Liturgies	3
MU	Ensemble	1
MU 100	Convocation	0

MU 333	Mat. & Org. Music	5
MU 353	Music History	3
MU 383	Performance (major)	3
MU	Ensemble	1
MU 100	Convocation	0
MU	Elective	6

FOURTH YEAR

FL	Foreign Language	5
MU 361	Conducting	3
MU 481	Performance (major)	3
MU	Ensemble	1
MU 100	Convocation	0
MU	Elective (Social or Nat. Sci.)	8

FL	Foreign Language	5
MU 415	Organ Lit. or Vocal Pedagogy	3
MU 482	Performance (major)	3
MU 362	Conducting	1
MU	Ensemble	1
MU 100	Convocation	0
MU	Elective (Social or Nat. Sci.)	3
MU	Elective	2

FL	Foreign Language	5
MU 416	Church Music Seminar	3
MU 483	Performance (major)	3
MU 453	Choral Lit.	3
MU	Ensemble	1
MU 100	Convocation	0

TOTAL—210 QUARTER HOURS**(D) Piano Pedagogy Major****FIRST YEAR****First Quarter**

EH 101	English Comp.	3
HY 101	World History	3
MU 131	Mat. & Org. Music	5
MU 184	Performance	1
MU 100	Convocation	0
MU	Elective	1
MU 251	Surv. Music Lit.	1
MU 327	Piano Ensemble	1
MU 187	Applied Minor	1

Second Quarter

EH 102	English Comp.	3
HY 102	World History	3
MU 132	Mat. & Org. Music	5
MU 185	Performance (major)	1
MU 100	Convocation	0
MU	Elective	1
MU 252	Surv. Music Lit.	1
MU 327	Piano Ensemble	1
MU 188	Applied Minor	1

Third Quarter

EH 103	English Comp.	3
HY 103	World History	3
MU 133	Mat. & Org. Music	5
MU 186	Performance (major)	1
MU 100	Convocation	0
MU	Elective	1
MU 253	Surv. Music Lit.	1
MU 327	Piano Ensemble	1
MU 189	Performance (minor)	1

SECOND YEAR

MU 231	Mat. & Org. Music	5
MU	Nat. Science	5
MU 284	Performance (major)	1
MU 287	Performance (minor)	1
MU 327	Piano Ensemble	1
MU 100	Convocation	0
MU	Elective	3

MU 232	Mat. & Org. Music	5
MU	Nat. Science	5
MU 285	Performance (major)	1
MU 288	Performance (minor)	1
MU 327	Piano Ensemble	1
MU 100	Convocation	0
MU	Elective	3

MU 233	Mat. & Org. Music	5
MH 100	Mathematics	5
MU 286	Performance (major)	1
MU 289	Performance (minor)	1
MU 327	Piano Ensemble	1
MU 100	Convocation	0
MU	Elective	3

THIRD YEAR

First Quarter		Second Quarter		Third Quarter	
MU 331	Mat. & Org. Music.....5	MU 332	Mat. & Org. Music.....5	MU 333	Mat. & Org. Music.....5
MU 351	Music History.....3	MU 352	Music History.....3	MU 353	Music History.....3
PA 210	Philosophy.....3	PA 214	Philosophy.....3	MU 361	Conducting.....3
MU 384	Performance (major).....1	MU 385	Performance (major).....1	MU 386	Performance (major).....1
MU 327	Piano Ensemble.....1	MU 327	Piano Ensemble.....1	MU 327	Piano Ensemble.....1
MU 457	Keyboard Lit.....1	MU 458	Keyboard Lit.....1	MU 459	Keyboard Lit.....1
	Soc. or Nat. Science.....3		Soc. or Nat. Science.....3		Soc. or Nat. Science.....3
MU 100	Convocation.....0	MU 100	Convocation.....0	MU 100	Convocation.....0

FOURTH YEAR

FL	Foreign Language.....5	FL	Foreign Language.....5	FL	Foreign Language.....5
MU 447	Piano Pedagogy.....3	MU 448	Piano Pedagogy.....3	MU 449	Piano Pedagogy.....3
MU 327	Piano Ensemble.....1	MU 327	Piano Ensemble.....1	MU 327	Piano Ensemble.....1
MU 484	Performance (major).....1	MU 485	Performance (major).....1	MU 486	Performance (major).....1
	Soc. or Nat. Science.....3		Soc. or Nat. Science.....3		Soc. or Nat. Science.....3
MU 337	Modern Harmony.....3		Elective.....3		Elective.....3
MU 100	Convocation.....0	MU 100	Convocation.....0	MU 100	Convocation.....0

TOTAL—195 QUARTER HOURS

Bachelor of Arts

FIRST YEAR

First Quarter		Second Quarter		Third Quarter	
MU 131	Mat. & Org. Music.....5	MU 132	Mat. & Org. Music.....5	MU 133	Mat. & Org. Music.....5
EH 101	English Comp.....3	EH 102	English Comp.....3	MH 100	Mathematics.....5
HY 101	World History.....3	HY 102	World History.....3	EH 103	English Comp.....3
MU 184	Performance.....1	PA 211	Philosophy.....3	HY 103	World History.....3
MU	Ensemble.....1	MU 185	Performance.....1	MU 186	Performance.....1
	Elective.....3	MU	Ensemble.....1	MU	Ensemble.....1
MU 100	Convocation.....0	MU 100	Convocation.....0	MU 100	Convocation.....0

SECOND YEAR

MU 231	Mat. & Org. Music.....5	MU 232	Mat. & Org. Music.....5	MU 233	Mat. & Org. Music.....5
	Natural Science.....5		Natural Science.....5	EH 255	English Lit.....3
EH 253	English Lit.....3	EH 254	English Lit.....3	MU 286	Performance.....1
MU 284	Performance.....1	MU 285	Performance.....1	MU	Ensemble.....1
MU	Ensemble.....1	MU	Ensemble.....1	AT 171	Art History.....3
PE	Physical Education.....1	MU 100	Convocation.....0	MU 100	Convocation.....0
MU 100	Convocation.....0	MU 252	Surv. Mu. Lit.....1		Elective.....5
MU 251	Surv. Mu. Lit.....1			MU 253	Surv. Mu. Lit.....1

THIRD YEAR

MU 331	Mat. & Org. Music.....5	MU 332	Mat. & Org. Music.....5	MU 333	Mat. & Org. Music.....5
MU 351	Music History.....3	MU 352	Music History.....3	MU 353	Music History.....3
MU 384	Performance.....1	MU 385	Performance.....1	MU 386	Performance.....1
PA 212	Philosophy.....3	MU 100	Convocation.....0	MU 100	Convocation.....0
MU 100	Convocation.....0		Academic Minor.....5		Academic Minor.....5
	Academic Minor.....5		Elective (Social or Nat. Science).....3		Elective (Social or Nat. Science).....3

FOURTH YEAR

PG 211	Psychology.....3	FL	Foreign Language.....5	FL	Foreign Language.....5
MU 484	Performance.....1	MU 361	Conducting.....3	MU 486	Performance.....1
FL	Foreign Language.....5	MU 485	Performance.....1	MU 100	Convocation.....0
MU 100	Convocation.....0	MU 100	Convocation.....0		Academic Minor.....5
	Academic Minor.....5		Academic Minor.....5		Elective (Social or Nat. Science).....3
	Elective (Social or Nat. Science).....3		Elective (Social or Nat. Science).....3		

TOTAL—200 QUARTER HOURS

*A minor of 30 quarter hours elected from approved courses.

Keyboard proficiency is required for non-keyboard majors. In such cases three of the applied music credits will be taken in piano.

Supplementary Requirements for Bachelor of Music and Bachelor of Arts Degree Candidates

1. Attendance at student convocations is compulsory. Absences may be excused only by the Head of the Music Department.
2. At the end of the Sophomore year a comprehensive examination will be given which must be passed before the student is admitted to the upper division music courses. Transfer students must complete this examination to receive junior standing.
 3. A. Students electing the performance major will present a junior recital during the third year of study and a senior recital during the fourth year of study.
 - B. Students electing the Theory and Composition major will present an original composition in small form during the third year of study and an original composition in large form during the fourth year of study.
 - C. Students electing the History and Literature major will present a written thesis during the fourth year of study.
 - D. Students electing the Church Music major will present a senior recital during the fourth year of study.
 - E. Students electing the Piano Pedagogy major will present a senior recital during the fourth year of study.
4. Credit in private instruction is based on the amount of practice, each credit hour requiring a minimum of five hours practice per week.
5. Students whose major performing medium is not piano or organ will elect piano as the minor instrument.
6. Participation in an approved music performing group is required each quarter, with or without credit. Participation in opera workshop is required of junior and senior voice majors.
7. All students taking private instruction will meet public performance requirements as designated by the faculty. (See Music Department special regulations regarding requirements for jury examinations and convocation performances.)

Music Education

Teacher Education: Admission to the Teacher Education Program of the School of Education is open to students registered in the School of Architecture and Fine Arts to the same extent that it is open to students registered in the School of Education. Upon completion of all requirements of both the Teacher Education Program and the professional curriculum in music, the Dean of the School of Education will recommend to the appropriate State Department of Education that a professional certificate be issued. It is considered desirable for students who wish to engage in junior high or high school teaching to identify this objective as soon as possible in their four-year undergraduate work. Such students will be advised by two advisers, a professional education adviser in the School of Education and an academic adviser in the Department of Music. The advisers will counsel in their respective areas.

Music Organizations

Several musical organizations, sponsored by the University and directed by the Department of Music, provide excellent training in group music. See section on musical groups in the student handbook, *Tiger Cub*. These activities, which are open to students of the University, may be taken with or without credit.

Graduate Work in Music

Admission to graduate work toward the Master of Music Degree requires a Bachelor's degree in music, music education, or the equivalent from this or another recognized institution. Admission to graduate study in the Music Department shall be in accordance with policies of the Graduate School. In addition, all candidates must take entrance examinations in music theory and history administered by members of a Departmental Screening Committee, demonstrate competency at the keyboard, and fulfill additional requirements as follows:

Instrumental Majors—Audition

Voice Majors—Audition and demonstration of satisfactory diction in Italian, French, and German.

(See graduate catalogue for details)

Students who hold a baccalaureate degree in Education with a Major in Music are eligible to apply to the Dean of the Graduate School for admission to the graduate courses leading to the degrees Master of Science and Master of Education with Major in Music.

Department of Theatre

The Department of Theatre provides instruction and production experience to students interested in developing their talents in the theatrical arts, whether as majors or non-majors. To permit students to explore their personal resources in theatre, a broad range of classroom, laboratory, and performance experiences is provided in acting, directing, scenic and lighting design, costume design, theatre technology, construction and crafts, theatre history, dramatic literature, theatre criticism, and theatre administration and management.

The Bachelor of Fine Arts degree is specifically for those students of outstanding talent who enter college with a firm idea of their professional goals or who discover them soon after entering undergraduate study. This major (TH) is for students seeking professional training and/or desiring an intensive program of theatre studies with a high degree of specialization in one of two areas of concentration: i.e., Theatre Performance or Theatre Design and Technology. Admission to advanced standing in the program involves an audition or presentation of portfolio with continued quarterly review. Final recommendation for graduation is made after the successful presentation of a recital and/or portfolio during the candidate's final quarter.

The Bachelor of Arts degree is designed for students seeking the broadest possible exposure in the study of theatre and drama within the liberal arts curriculum. It is for students who choose to emphasize theatre as a humanistic study and/or who wish to specialize in theatre history/criticism and dramatic literature. The specific requirements for the major (GTH) in this program may be found in the Arts and Sciences section of the *Bulletin*.

A curriculum in theatre/business management through the General Business-Theatre Professional Option, an interdepartmental program between the Departments of Management and Theatre, is administered by the School of Business. This major (GBT) is for students who wish to pursue a career in professional theatre business management.

Students in the School of Arts and Sciences, in addition to a theatre major, may elect a minor (15 hours) or a double minor (30 hours). Those wishing to minor in Theatre should consult the department head for specific recommendations and the assignment of a minor adviser.

Professional Curriculum in Theatre (TH)

Theatre Performance Major

FIRST YEAR					
First Quarter		Second Quarter		Third Quarter	
TH 100	Theatre Convocation ...0	TH 100	Theatre Convocation ...0	TH 100	Theatre Convocation ...0
TH 300	Theatre Laboratory ...1	TH 300	Theatre Laboratory ...1	TH 300	Theatre Laboratory ...1
TH 101	Intr. to the Theatre ...3	TH 211	Acting: Fund. ...4	TH 261	Costume Construction ...4
TH 231	Theatre Technology I ...4	TH 265	Stage Makeup ...3	EH 103	English Comp. ...3
EH 101	English Comp. ...3	EH 102	English Comp. ...3	HY 103	World History ...3
HY 101	World History ...3	HY 102	World History ...3		Philosophy or Math ...5
	Elective ...1		Elective ...1		Elective ...1
SECOND YEAR			THIRD YEAR		
TH 100	Theatre Convocation ...0	TH 100	Theatre Convocation ...0	TH 100	Theatre Convocation ...0
TH 300	Theatre Laboratory ...1	TH 300	Theatre Laboratory ...1	TH 300	Theatre Laboratory ...1
TH 212	Acting: Techniques ...4	TH 215	Stage Voice ...2	TH 271	Play Analysis ...4
TH 240	Theatrical Design ...4		Natural Science ...5	TH 311	Acting: ...4
	Natural Science ...5		Theatre Electives ...4		Characterization ...4
	Electives ...4		Electives ...6		Nat. or Soc. Sci. ...5
					Electives ...4
FOURTH YEAR			THIRD YEAR		
TH 100	Theatre Convocation ...0	TH 100	Theatre Convocation ...0	TH 100	Theatre Convocation ...0
TH 300	Theatre Laboratory ...1	TH 300	Theatre Laboratory ...1	TH 300	Theatre Laboratory ...1
TH 321	Directing I ...4	TH 312	Acting: Scene Study ...4	TH 373	Theatre History III ...4
TH 371	Theatre History I ...4	TH 372	Theatre History II ...4		Nat. or Soc. Sci. ...5
	Nat. or Soc. Sci. ...5		Nat. or Soc. Sci. ...5		Theatre Electives ...4
	Electives ...5		Electives ...5		Electives ...5
FOURTH YEAR			FOURTH YEAR		
TH 100	Theatre Convocation ...0	TH 100	Theatre Convocation ...0	TH 100	Theatre Convocation ...0
TH 300	Theatre Laboratory ...1	TH 300	Theatre Laboratory ...1	TH 300	Theatre Laboratory ...1
TH 413	Acting: Auditions ...4		Theatre Electives ...9		Theatre Electives ...9
	Theatre Electives ...5		Electives ...6		Electives ...6
	Electives ...6				

TOTAL — 206 QUARTER HOURS

Theatre Design & Technology Major

FIRST YEAR			THIRD YEAR		
First Quarter			Second Quarter		
TH 100 Theatre Convocation ...0	TH 100 Theatre Convocation ...0	TH 100 Theatre Convocation ...0	TH 100 Theatre Convocation ...0	TH 100 Theatre Convocation ...0	TH 100 Theatre Convocation ...0
TH 300 Theatre Laboratory ...1	TH 300 Theatre Laboratory ...1	TH 300 Theatre Laboratory ...1	TH 300 Theatre Laboratory ...1	TH 300 Theatre Laboratory ...1	TH 300 Theatre Laboratory ...1
TH 101 Intr. to Theatre ...3	TH 211 Acting: Fund ...4	TH 261 Costume Construction ...4	TH 211 Acting: Fund ...4	TH 261 Costume Construction ...4	TH 261 Costume Construction ...4
TH 231 Theatre Technology I ...4	TH 232 Theatre Technology II ...4	EH 103 English Comp. ...3	TH 232 Theatre Technology II ...4	EH 103 English Comp. ...3	EH 103 English Comp. ...3
EH 101 English Comp. ...3	EH 102 English Comp. ...3	AT 173 Art History III ...3	EH 102 English Comp. ...3	AT 173 Art History III ...3	AT 173 Art History III ...3
AT 171 Art History I ...3	AT 172 Art History II ...3	PA 202 Ethics & Society ...5	AT 172 Art History II ...3	PA 202 Ethics & Society ...5	PA 202 Ethics & Society ...5
Elective ...1	Elective ...1	Elective ...1	Elective ...1	Elective ...1	Elective ...1
SECOND YEAR			THIRD YEAR		
TH 100 Theatre Convocation ...0	TH 100 Theatre Convocation ...0	TH 100 Theatre Convocation ...0	TH 100 Theatre Convocation ...0	TH 100 Theatre Convocation ...0	TH 100 Theatre Convocation ...0
TH 300 Theatre Laboratory ...1	TH 300 Theatre Laboratory ...1	TH 300 Theatre Laboratory ...1	TH 300 Theatre Laboratory ...1	TH 300 Theatre Laboratory ...1	TH 300 Theatre Laboratory ...1
TH 240 Theatrical Design ...4	TH 233 Drafting ...4	TH 271 Play Analysis ...4	TH 240 Theatrical Design ...4	TH 271 Play Analysis ...4	TH 271 Play Analysis ...4
TH 345 Rendering ...4	TH 362 Costume History II ...4	TH 351 Lighting Design ...4	TH 345 Rendering ...4	TH 351 Lighting Design ...4	TH 351 Lighting Design ...4
TH 361 Costume History I ...4	PHS 101 Intr. to Phys. Sc. ...5	TH 365 Costume Design I ...4	TH 361 Costume History I ...4	TH 365 Costume Design I ...4	TH 365 Costume Design I ...4
PHS 100 Intr. to Phys. Sc. ...5	Theatre Elective ...4	ANT 203 Intr. to Anthropology ...5	PHS 100 Intr. to Phys. Sc. ...5	ANT 203 Intr. to Anthropology ...5	ANT 203 Intr. to Anthropology ...5
FOURTH YEAR			THIRD YEAR		
TH 100 Theatre Convocation ...0	TH 100 Theatre Convocation ...0	TH 100 Theatre Convocation ...0	TH 100 Theatre Convocation ...0	TH 100 Theatre Convocation ...0	TH 100 Theatre Convocation ...0
TH 300 Theatre Laboratory ...1	TH 300 Theatre Laboratory ...1	TH 300 Theatre Laboratory ...1	TH 300 Theatre Laboratory ...1	TH 300 Theatre Laboratory ...1	TH 300 Theatre Laboratory ...1
TH 333 Scene Painting ...4	TH 265 Stage Makeup ...3	TH 332 Stage Carpentry ...4	TH 333 Scene Painting ...4	TH 332 Stage Carpentry ...4	TH 332 Stage Carpentry ...4
TH 366 Costume Design II ...4	TH 341 Scene Design I ...4	TH 342 Scene Design II ...4	TH 366 Costume Design II ...4	TH 342 Scene Design II ...4	TH 342 Scene Design II ...4
TH 371 Theatre History I ...4	TH 372 Theatre History II ...4	TH 373 Theatre History III ...4	TH 371 Theatre History I ...4	TH 372 Theatre History II ...4	TH 373 Theatre History III ...4
Electives ...4	Nat. or Soc. Science ...5	TH 462 Adv. Cost. Const. II ...4	Electives ...4	Nat. or Soc. Science ...5	TH 462 Adv. Cost. Const. II ...4
FOURTH YEAR			THIRD YEAR		
TH 100 Theatre Convocation ...0	TH 100 Theatre Convocation ...0	TH 100 Theatre Convocation ...0	TH 100 Theatre Convocation ...0	TH 100 Theatre Convocation ...0	TH 100 Theatre Convocation ...0
TH 300 Theatre Laboratory ...1	TH 300 Theatre Laboratory ...1	TH 100 Theatre Laboratory ...1	TH 300 Theatre Laboratory ...1	TH 100 Theatre Laboratory ...1	TH 100 Theatre Laboratory ...1
TH 321 Directing I ...4	TH 441 History of Design ...4	TH 331 Adv. Theatre	TH 321 Directing I ...4	TH 331 Adv. Theatre	TH 331 Adv. Theatre
TH 461 Adv. Cost. Const. I ...4	Electives ...12	Technology ...4	TH 461 Adv. Cost. Const. I ...4	Technology ...4	Technology ...4
Nat. or Soc. Science ...5		Nat. or Soc. Science ...5	Nat. or Soc. Science ...5	Nat. or Soc. Science ...5	Nat. or Soc. Science ...5
Electives ...4		Electives ...4	Electives ...4	Electives ...4	Electives ...4

TOTAL — 206 QUARTER HOURS



School of Arts and Sciences

EDWARD H. HOBBS, *Dean*

LESLIE CAINE CAMPBELL, *Associate Dean*

WILLIAM L. ALFORD, *Associate Dean*

THE SCHOOL OF ARTS AND SCIENCES is the oldest and largest school in Auburn University. Three academic areas — humanities, physical sciences, and social sciences — are represented by the School's 15 departments — Chemistry, English, Foreign Languages, Geography, Geology, History, Journalism, Mathematics, Philosophy, Physics, Political Science, Psychology, Religion, Sociology and Anthropology, and Speech Communication.

In the School of Arts and Sciences a student can gain a broad general education and also acquire depth in the particular field in which he majors. This combination equips him with a strong foundation for post-baccalaureate specialization in graduate studies or professional schools. A further function of this school is to provide courses which are needed by students of all other instructional divisions of the University.

Undergraduate Degrees

Four-year bachelor's degree programs are offered in three areas:

1. The *General Curriculum* offers options in 22 major fields, with a wide choice of minors available both within the School of Arts and Sciences and in other schools of the University.

2. *Pre-professional Programs* are offered in pre-law, pre-dentistry, pre-medicine, pre-optometry, pre-hospital and health services administration, pre-occupational therapy, pre-physical therapy, pre-pharmacy, and pre-veterinary medicine.

3. *Special Curricula* are available in chemistry, chemistry with biochemistry option, criminal justice, criminology, foreign languages-international trade, geology, laboratory and medical technology, Latin American studies, mathematics, applied mathematics, physics, applied physics, public administration, public relations, Spanish and social work.

Embodied in these curricula are the requirements of the University-wide Liberal Education Program.

Graduate Degrees

Master of Arts degrees are offered in English, French, Spanish, history, political science, sociology, and speech communication. Master of Science degrees are offered in chemistry, geology, mathematics, physics, and psychology.

Two special degrees, Master of French Studies and Master of Hispanic Studies, are offered by the Department of Foreign Languages. The School of Arts and Sciences participates in the offering of an interdisciplinary degree, Master of Arts in College Teaching.

Doctor of Philosophy degrees are offered in chemistry, English, history, mathematics, physics, and psychology. Degree programs are described in the *Graduate School Bulletin*.

Dual Degree Program in Engineering

This program provides for enrollment in the General Curriculum of the School of Arts and Sciences for approximately three academic years and in the School of Engineering for approximately two academic years.

The student must complete the basic requirements of the General Curriculum and the requirements for a major therein. The student is not required to complete the minors or take the usual number of hours of electives. Thus he may transfer to the School of Engineering after the end of his Junior Year. Following completion of the academic requirements for one of the eleven baccalaureate degrees in the School of Engineering, he will be awarded two degrees: a degree in his Arts and Sciences major, either a bachelor of science or bachelor of arts depending upon major chosen, and a bachelor's degree in the designated Engineering field. See *Arts and Sciences Bulletin* for more information.

Curriculum in Materials Engineering

An interdisciplinary curriculum in materials engineering is administered by the Department of Mechanical Engineering in the School of Engineering. It is conducted cooperatively by academic departments of the schools of Engineering and Arts and Sciences through a faculty Materials Engineering Curriculum Committee. (See page 156).

Certificate in Aging Studies

The Certificate in Aging Studies is a multidisciplinary program designed for students interested in problems of aging persons which will give them a general competency in gerontology. The career-oriented option complements a student's major field of study and, upon completion of the 25 hours, leads to a Certificate in Aging Studies. The program is open to all students who choose to use their elective hours in this manner. Interested students should contact the Office of the Dean.

East-European and Russian Studies Program

A student enrolled in the General Curriculum and majoring in history (GHY), philosophy (GPA), or political science (GPO) may elect the East-European and Russian Studies Program. Upon completion of this program and earning a bachelor's degree, the achievement will be noted in the student's transcript.

Consult the Chairman of the Committee on East-European/Russian and Asian Studies regarding this option.

Latin American Studies Program

The student desiring to pursue interdisciplinary studies in the Latin American area may enroll in the Special Curriculum in Latin American Studies. Required are a major in either history (LAH), Spanish (LAF), or political science (LAP), and concentrations in both remaining disciplines. Consult with departmental or the dean's advisers for more information.

Cooperative Education Programs

Cooperative Education Programs which give students an opportunity to integrate their academic training with work experience are offered in art, biology, chemistry, criminal justice, journalism, mathematics, applied mathematics, physics, applied physics, political science, pre-law, psychology, sociology, and speech communication. Students alternate each quarter between school and a work assignment provided through the Director of the Cooperative Education Program.

Advisory Services for Students

The head of the department (or his designee) in which the student majors becomes the student's adviser and is charged with outlining the student's major and minor work. The Office of the Dean, however, provides counseling services to the student before he declares a major. For pre-professional students, counseling on professional school admission tests, admissions requirements and other such matters is provided by special committees and advisers as listed in the *Arts and Sciences Bulletin*.



The General Curriculum (GC)

The General Curriculum is designed to broaden the student intellectually through the humanities and the natural and social sciences. Twenty-two majors are available under this curriculum. (See pages 84-87.)

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
FL		Foreign Language*.....5	FL		Foreign Language*.....5	FL		Foreign Language*.....5
		Group Req. I.....3-5			Group Req. I.....3-5			Group Req. I.....3-5
EH 101		English Comp.....3	EH 102		English Comp.....3	EH 103		English Comp.....3
HY 101		World History.....3	HY 102		World History.....3	HY 103		World History.....3
		ROTC or Elective.....1			ROTC or Elective.....1			ROTC or Elective.....1

SOPHOMORE YEAR

PO 209		American Govt.....5	PO 210		State & Local Govt.....5	SY 201		Intr. Sociology.....5
GY		Geography**.....5			Elective.....3-5			Elective.....3-5
		Group Req. II.....5			Group Req. II.....5			Group Req. III.....3-5
EH		Literature**.....3	EH		Literature**.....3	EH		Literature**.....3
		ROTC or Elective.....1			ROTC or Elective.....1			ROTC or Elective.....1

*A foreign language through the first year sequence as a minimum. (See page 86.)

**GY 102, World Geography, or a geography course approved by the department of the student's major.

***EH 253-254-255 or EH 260-261-262 or EH 250-251.

JUNIOR AND SENIOR YEARS

During the junior and senior years the student is to complete his major requirements of at least 35 hours, two minors of at least 15 hours each (or a double minor of at least 30 hours), and elective work to total 201 hours. All major and minor courses are to be numbered 200 or above.

TOTAL—201 QUARTER HOURS

GROUP REQUISITE I, MATHEMATICS-PHILOSOPHY. The student should take a minimum of ten hours in mathematics, or ten hours in philosophy, or ten hours in mathematics and philosophy, choosing the mathematics course or courses from MH 100, 140 or 160 (not both), 155, 161, 162, 163, and choosing the philosophy course or courses from PA 202, 210, 211, 212, 214, 216. Any mathematics or philosophy courses which are requisites to the student's major program will apply in fulfillment of this Group Requisite as well. Group Requisite I may be completed in either two or three quarters, depending upon the combination of courses chosen.

GROUP REQUISITE II, SCIENCE. A minimum of 10 hours in one science, including corresponding laboratories, from the following: BI 101-102, 101-103, 101-104, BI 101-BY 201, CH 101-102-104, 103-104, GL 101-102, 110-103, PS 205-206, PS 220-221-222, or PHS 100-101.

GROUP REQUISITE III, HUMANITIES-SOCIAL SCIENCES. A course (3-5 hours) in art, economics (preferably 206), journalism (preferably 315), music, psychology, religion, speech communication, or theatre.

Majors and Minors in the General Curriculum

A student undecided about a major may delay declaring one until the end of his fifth quarter. Before a major is declared, his curriculum will be identified by the symbol GC (General Curriculum). As soon as he is reasonably certain, however, he should declare his major and identify it by the appropriate departmental symbol. (See page 87.) Students should consult with their departmental advisers regularly to plan their major work, clear prerequisites, and take their major courses according to departmental schedule. A minimum of 35 hours is required in each major. All courses must normally be numbered 200 or above.

BACHELOR OF ARTS: Anthropology, Art, Comparative Literature, Earth Sciences, English, Foreign Language, History, Journalism, Philosophy, Political Science, Psychology, Religion, Social Work, Sociology, Speech Communication, and Theatre.

BACHELOR OF SCIENCE: Biology, Chemistry, Economics, Geography, Mathematics, and Physics.

Since some of the above majors require alignment of courses beginning in the freshman and sophomore years, it is important that the student be alert early in his college career to all of the requirements of his major.

MINORS: Because the student's major will affect his choice of minors it is very important that he consult with his major departmental adviser before selecting either two minors (minimum of 15 hours credit in each) or one double minor (minimum of 30 hours credit) from the following: anthropology, architecture, art, botany, chemistry, criminal justice, economics, English, foreign language, geography, geology, history, journalism, mathematics, music, philosophy, physical education, physics, political science, psychology, religion, sociology, speech communication, theatre, zoology, and additional approved subjects in the Schools of Agriculture, Business, Education, Engineering, or Home Economics. Minor courses must normally be numbered 200 or above. Selected courses at the 100-level are, however, included in art, music, and theatre; for requirements in these fields, the student should see his adviser. A student cannot major and minor in the same field (except in foreign language; see page 86).

THE ANTHROPOLOGY MAJOR. Prerequisites: SY 201. The major will include ANT 203, SY 220, 370, ANT 303 or 403, plus an additional course in each of the four subdisciplines of anthropology: cultural, linguistic, archaeological and physical anthropology. With departmental permission a student may meet the distribution requirement with courses taught in other departments, but hours taken within the major must total 40.

THE ART MAJOR. Prerequisites: AT 111-112-113, and 121-122-123. The major will include AT 231, 232 or 333; 241, 242 or 343; 251, 252 or 353; and 371-372-373, plus 15 hours of art courses at the 200-level or above. (See also Curriculum in Visual Arts in the School of Architecture and Fine Arts.)

THE BIOLOGY MAJOR. Prerequisites: BI 101-102-103, CH 103-104 including labs, MH 160-161, CH 207-208 and labs, and PS 205-206. The major will include BY 300, 306, ZY 300, 301, 303, 306, and 310, plus 20 hours of 500-level BY and ZY courses to be selected in consultation with the GBI adviser. Students in pre-professional curricula should consult their advisers for special requirements for the Biology Major. (See also Special Curricula in Biological Sciences in the School of Agriculture.)

THE CHEMISTRY MAJOR. Prerequisites: CH 103-104-105 and labs (or 111-112-113), MH 160-161-162, PS 205-206 (or 220-221-222). The major will include CH 204-205, 207-208-209 and labs, plus ten hours of chemistry courses at the 300-level or above. (See also special curricula in Chemistry.)

THE COMPARATIVE LITERATURE MAJOR. Prerequisites: EH 260-261-262. The major will include 25 hours chosen from: EH 312, 340, 353, 571, 573, 574, 575, FL 371, 372, and 373, plus ten hours of 300-level or above in English Literature courses or in the literature of a second foreign language if the student can demonstrate proficiency in that language. The student will double minor in one foreign language including five 3-hour courses at the 300-level or above. In special cases the Comparative Literature Committee may accept a minor in another field in place of the Foreign Language Minor. (See also the English/Comparative Literature option in the School of Education, Department of Secondary Education.)

THE EARTH SCIENCES MAJOR. Prerequisites: MH 161, CH 103-104-105 (or three approved courses in biology, botany and/or zoology), GL 103 and 110. The major will include GL 215, 240, plus 20 hours of geology courses at the 200-level or above, plus four 15-hour sequences in other departments subject to approval by the student's advisory committee. Two of these sequences will fulfill the requirements for minors. (See also Special Curriculum in Geology.)

THE ECONOMICS MAJOR. Prerequisites: EC 200 and 202. The major will include EC 551, 554, and 556; plus 20 hours of economics courses at the 300-level or above. EC 206 cannot count toward the major. (See also Curriculum in Economics in the School of Business.)

THE ENGLISH MAJOR. Prerequisites: EH 253-254-255 (or, if qualified, EH 250-251), 20 hours of one foreign language, and five hours of English or European history. The major will include eight approved courses chosen from categories II-VII, two of which will be from Category II, two from Category III, and EH 390. Category VIII courses may be used for general elective credit only. A minimum of 40 hours is required for this major. Within

the regular English major program a student may choose an American literature concentration, which will include EH 357, 358, and three courses from EH 472, 591, 592, or 595 in addition to those courses stipulated above; RL 340, HY 511, and 512 are recommended; a list of other suggested courses is available from departmental advisers.

THE FOREIGN LANGUAGE MAJOR. Prerequisites: 15 hours of first-year level course work in the chosen language. The major will include 35 hours of courses at the 200-level or above in the chosen language. Spanish majors will take FL 334-335-336. The student may have a major in one language and a single minor in one other. In this case the student may count toward the bachelor's degree, beyond the 80-hour limit, the number of hours received through advanced placement to a maximum of 15. For advanced placement see page 30. (See also Special Curriculum in Foreign Language—International Trade.)

THE GEOGRAPHY MAJOR. Prerequisites: GY 102, 214, 215, EH 304, either SY 220, IE 220 or MN 274. The major will include GY 400, 440, plus 20 or more hours of geography courses at the 300-level or above, including at least one regional geography course.

THE HISTORY MAJOR. Prerequisites: HY 101-102-103. The major will include either HY 201-202 or 207-208 plus at least 25 hours of history courses at the 300-level or above. The student should consult the History Department each quarter of his junior and senior years regarding completion of his major and minor fields.

THE JOURNALISM MAJOR. Prerequisites: EH 101-102-103, JM 101. The major will include JM 221 (should be scheduled during the sophomore year), 222, 313, 314, 321, 322, 323, 421, 465, 485, and 422-423 or 425. A minimum of 48 hours is required for this major. (See also different journalism major in the Special Curriculum in Public Relations.)

THE MATHEMATICS MAJOR. Prerequisites: MH 161-162-163. The major for *Plan I*, which is oriented toward theoretical mathematics and preparation for graduate school will include MH 264, 265 or 269, 266, 331-332, 520-521, plus two additional approved upper-level mathematics courses. Under *Plan II*, which provides preparation for a computer-related career, the major will include MH 264, 265 or 269, 266, 331, 518, 520, 560, 567, plus one additional approved upper-level course. In order to graduate with a major in mathematics, a student must have an overall C average or better in all mathematics courses attempted which are required for the major, above the 100-level, and for which a grade other than W has been assigned. The minor will not include courses numbered in the 280's or 580's. (See also Special Curricula in Mathematics.)

THE PHILOSOPHY MAJOR. Prerequisites: PA 210, 211 (370 may be substituted with approval), 214 (202 may be substituted with approval). The major will include PA 333 (or 470 or 475 with approval), 334 (or 482, 484, or 590 with approval), 335 (or 380, 402, 432, 513, 580, or 591 with approval), plus 20 hours of philosophy courses at the 300-level or above, at least 15 of which should be 400-500-level.

THE PHYSICS MAJOR. MH 161-162-163, 264, 269 and IE 204. The ten-hour natural science requirement must be met with either chemistry, biology or geology courses (with labs). The major will include PS 220, 221, 222, 300, 301, 302, 303, 305, 306 and nine additional credit hours in upper level physics courses. The minor will consist of PS 220, 221, 222 and 305. (See also Special Curricula in Physics and Applied Physics.)

THE POLITICAL SCIENCE MAJOR. Prerequisites: MH 140 or 160, or 161. The major will include a minimum of one course to be chosen from PO 300, 301, 521, or 590, and additional political science courses at the 200-level or above beyond PO 209 and 210. Ten hours, other than PO 450 or 451 (if taken), must be at the 400-500-level. (See also Special Curriculum in Public Administration.)

THE PSYCHOLOGY MAJOR. The major will include PG 211, 314, 315, 320, and at least one other course of experimental psychology, and four psychology courses at the 400-500-level. A minimum of 41 hours is required for this major.

THE RELIGION MAJOR. Prerequisite: RL 201. The major requires 40 hours in religion courses including 301, and ten hours from RL 210, 220, 230; 25 hours must be at the 300-level or above.

THE SOCIAL WORK MAJOR. Prerequisites: SY 201 and written approval of the Social Work Program, Department of Sociology and Anthropology. Students may obtain an application form and admission guidelines from the social work adviser, Department of Sociology and Anthropology. The ten-hour natural science requirement will be met with BI 101-104. Group Requisite III will be completed with EC 206. Elective hours will be partially filled with PG 330. The major will include SW 252, 375, 376; SY 304 or 520, 220, and 370; followed by SW 380, 506, 507, 508, 575, 520. A 15-hour minor in Sociology or Anthropology and one outside minor will accompany the major.

THE SOCIOLOGY MAJOR. Prerequisites: SY 201. The major will include ANT 203, SY 220, 409 or 502, 370 or RSY 370, plus additional courses to total 40 hours, which may include one additional ANT course. Sociology majors may minor in anthropology or social work.

THE SPEECH COMMUNICATION MAJOR. The major will include two courses chosen from SC 200, 301, 350; one course chosen from SC 202, 211, 273, 320, 378; four courses at the 500-level, plus 10 additional hours. A minimum of 45 hours is required for this major. See *different* speech major in the Special Curriculum in Public Relations.

THE THEATRE MAJOR. The following core courses are required: TH 101, TH 211, TH 231, TH 240, TH 261, TH 265, TH 271, TH 321, TH 371-372-373. In addition, theatre majors are required to enroll in TH 100 and TH 300 during every quarter of residency. The balance of elective theatre hours should be selected in consultation with the student's theatre faculty adviser. A minimum of 70 hours is required for the Theatre Major.

Symbols for Majors

The first letter in each symbol identifies the curriculum; the last two letters indicate the major.

Majors	General Curriculum	Pre-Law	Pre-Dentistry	Pre-Medicine	Pre-Optometry	Pre-Hosp. Adm.	Pre-Vet. Med.
Undeclared	GC	PL	PD	PM	OP	HA	PV
Anthropology	GAN						
Art	GAT						
Biology	GBI	LBI	DBI	MBI	OBI	HBI	VBI
Chemistry	GCH	LCH	DCH	MCH	OCH	HCH	VCH
Comparative Lit.	GCL	LCL	DCL	MCL	OCL	HCL	VCL
Earth Sciences	GGE	LGE	DGE	MGE	OGE	HGE	VGE
Economics	GEC	LEC	DEC	MEC	OEC	HEC	VEC
English	GEH	LEH	DEH	MEH	OEH	HEH	VEH
Foreign Lang.	GFL	LFL	DFL	MFL	OFL	HFL	VFL
Geography	GGY	LGY	DGY	MGY	OGY	HGY	VGY
Health Svc. Admin.						HSA	
Health Sys. Admin.						HSM	
History	GHY	LHY	DHY	MHY	OHY	HHY	VHY
Journalism	GJM	LJM	DJM	MJM	OJM	HJM	VJM
Mathematics	GMH	LMH	DMH	MMH	OMH	HMH	VMH
Philosophy	GPA	LPA	DPA	MPA	OPA	HPA	VPA
Physics	GPS	LPS	DPS	MPS	OPS	HPS	VPS
Political Science	GPO	LPO	DPO	MPO	OPO	HPO	VPO
Psychology	GPG	LPG	DPG	MPG	OPG	HPG	VPG
Religion	GRL	LRL	DRL	MRL	ORL	HRL	VRL
Social Work	GSW	LSW				HSW	
Sociology	GSY	LSY	DSY	MSY	OSY	HSY	VSY
Speech Comm.	GSC	LSC	DSC	MSC	OSC	HSC	VSC
Theatre	GTH						

Pre-Professional Curricula

Pre-professional programs are offered in pre-law, pre-dentistry, pre-medicine, pre-optometry, pre-hospital and health services administration, pre-occupational therapy, pre-physical therapy, pre-pharmacy, and pre-veterinary medicine. Advisers are available in each curriculum to guide the students concerning admissions requirements to the professional schools. The department in which students major will advise them in their major work. Completion of these curricula does not assure admission to a professional school. Competition for admission to professional schools is keen; the number of qualified applicants exceeds the number of places available.

Curriculum in Pre-Law (PL)

This curriculum is designed to prepare students for accredited professional law schools, most of which require for admission a bachelor's degree, a good scholastic record, and a good score on the national Law School Admission Test. The pre-law student should take the LSAT at least nine months ahead of the date he expects to enter law school.

A pre-law student who gains admission into an accredited law school short of a degree may obtain a combination bachelor's degree by completing the first three years of this curriculum (including the special requirements listed below) and the freshman year of law school.

FRESHMAN AND SOPHOMORE YEARS

The student will follow the General Curriculum and will take EC 200 as one course in Group Requisite II.

JUNIOR AND SENIOR YEARS

During the junior and senior years, the pre-law student will complete his major requirements of at least 35 hours, two minors of at least 15 hours each, or a double minor of at least 30 hours, and additional work to total 201 hours. He will take EC 202; PG 211; ACF 215; EH 390; HY 306; HY 571 or 527; PO 501 or 502; and SC 202 or 211 in his major, minor, requisites, or electives. Recommended in addition to these are SC 378 and an additional course in political science, or PG 435.

TOTAL—201 QUARTER HOURS

Major in the Pre-Law Curriculum

BACHELOR OF ARTS: English, Comparative Literature, Earth Sciences, Foreign Language, History, Journalism, Philosophy, Political Science, Psychology, Sociology, Social Work, and Speech Communication.

BACHELOR OF SCIENCE: Biology, Chemistry, Economics, Geography, Mathematics, and Physics.

A student, upon selection of a major, should check requirements and utilize Group Requisites I, II and III as much as possible to clear lower level requisites during his freshman and sophomore years. (See Symbols for Majors on page 87.)

Students may take no more than 25 percent of degree requirements in courses offered by the School of Business.

Curriculum in Pre-Dentistry (PD), and Pre-Medicine (PM)

This curriculum leads to a Bachelor of Science degree and is designed to prepare students for medical and dental schools. The requirements are very exacting and demand high scholastic competence and performance. Students must strive for a B-plus four-year college record to attain good promise of being selected by a professional school.

The bachelor's degree is required by most dental and medical schools for admission; however, should an outstanding student gain admission to a dental or medical school prior to graduation, he may receive a combination B.S. degree by completing successfully the first nine quarters of this curriculum, including the special requirements listed under the Junior and Senior years below, a total of 157 quarter hours, and the freshman year of professional school.

A student in pre-dentistry or pre-medicine should take the national Dental Aptitude Test or the Medical College Admission Test at least a year in advance of the date he plans to enter professional school, and follow with an application to the professional school of his choice. The student should seek information from the Premedical-Pre dental Advisory Committee concerning procedures he must follow to obtain the necessary committee evaluation and recommendation to the professional school to which he seeks admission early in his junior year. Forms and instructions are available in the office of the Dean of Arts and Sciences.

Clinical Preceptorship. The Department of Mathematics participates with the Institute of Medicine and Mathematics of Ohio University, whereby certain pre-medical students who have a strong concentration of work in mathematics (about 50 credit hours) may upon recommendation of the Department of Mathematics be awarded clinical preceptorships which may enhance their acceptance at a medical college. Interested students should contact the head of the department for further information.

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
CH 111	General Chemistry	5	CH 112	General Chemistry	5	CH 113	General Chemistry	5
MH 161	An. Geom. & Cal.	5	MH 162	An. Geom. & Cal.	5	MH 163	An. Geom. & Cal.	5
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
HY 101	World History	3	HY 102	World History	3	HY 103	World History	3
	ROTC or Elective	1		ROTC or Elective	1		ROTC or Elective	1

SOPHOMORE YEAR

BI 101	Prin. Biol. & Lab.	5	BI 103	Animal Biol. & Lab.	5	ZY 310	Cell Biology	5
CH 207	Organic Chem. & Lab.	5	CH 208	Organic Chem. & Lab.	5	CH 209	Organic Chemistry & Lab.	5
PS 205	Intr. Physics	5	PS 206	Intr. Physics	5	PS 210	Modern Physics	5
EH	Literature*	3	EH	Literature*	3	EH	Literature*	3
	ROTC or Elective	1		ROTC or Elective	1		ROTC or Elective	1

*EH 253-254-255 or EH 260-261-262 or EH 250-251.

The student must declare a major by the end of his sixth quarter.

JUNIOR AND SENIOR YEARS

During the junior and senior years the student will complete the following special requirements: (a) EH 390, PG 211, 212, PO 209, SY 201, an additional PO or SY course, ZY 300, 302, one 200-level philosophy course, preferably PA 218, and (b) the requirements of his major which are to be selected from those listed under Symbols for Majors on page 87. Some recommended courses are ANT 203, 206, 207, AT 122, BI 102, BY 215, BY 300, BY 542, 543, CH 205, 316, 507, 508, 516, 519, 520, EC 200, 202, EH 141, FL through the first two quarters of the first year sequence as a minimum (see page 86), GL 101, 102, HY 306, GY 214, 215, IE 204, MH 264, 265, PG 315, RL (200-level), SC 211, SY 202, ZY 301, 519, 520, 524, 560, 561 and/or 300-400-500 level courses in anthropology, English, geography, history, philosophy, political science, psychology, religion, and sociology.

TOTAL—209 QUARTER HOURS

A student should become acquainted with the requirements for his major (see page 84) to begin as early as possible the alignment of courses required.

Curriculum in Pre-Hospital and Health Services Administration (HA)

This curriculum, leading to a Bachelor of Science degree, is designed to help prepare students for careers in such fields as hospital administration, health planning, nursing home administration, governmental health administration and other areas of health services administration. In addition to certain types of employment available immediately upon graduation from the undergraduate program, graduate training is available at other institutions through the Ph.D. level. Students interested in admission to such programs should maintain a B average, should take the appropriate Graduate Record Examination and should make application to the appropriate professional

school about a year in advance of the expected date of graduation. Students should consult the Pre-Hospital and Health Services Administration adviser for information on opportunities for employment after graduation and requirements for admission to graduate study.

The student may take no more than 25 percent of degree requirements in courses offered by the School of Business.

FRESHMAN YEAR											
First Quarter				Second Quarter				Third Quarter			
BI 101	Prin. Biol. & Lab.	5		BI 104	Biol. Human Affairs	5		PO 209	American Govt.	5	
MH 160	Pre-Cal. w. Trig.	5			Group Req. I	5			Group Req. II	3-5	
EH 101	English Comp.	3		EH 102	English Comp.	3		EH 103	English Comp.	3	
HY 101	World History	3		HY 102	World History	3		HY 103	World History	3	
	ROTC or Elective	1			ROTC or Elective	1			ROTC or Elective	1	
SOPHOMORE YEAR											
EC 200	Economics I	5		EC 202	Economics II	5		PO 301	Pol. Sci. Stat.	5	
ACF 211	Prin. of Accounting	4		ACF 212	Prin. of Accounting	4		SY 201	Intr. Sociology	5	
	Group Req. III	3-5		PG 211	Psychology	5		PG 212	Psychology	5	
EH	Literature*	3		EH	Literature	3		EH	Literature*	3	
	ROTC or Elective	1			ROTC or Elective	1			ROTC or Elective	1	

*EH 253-254-255 or EH 260-261-262 or EH 250-251.

The student must declare a major by the end of his sixth quarter.

JUNIOR AND SENIOR YEARS

During the junior and senior years the student will complete the following special requirements: (a) PO 325, 326, 360, 501 or 502, 518, SY 518, and (b) the requirements of his major to be selected from those listed under Symbols for Majors on page 87. Students should consult with the HA Adviser about recommended courses in the junior and senior year.

THE HEALTH SERVICES ADMINISTRATION MAJOR. Arts and Sciences students in the curriculum in Pre-Hospital and Health Services Administration who select this major will take PO 333, 410, 420, 450, 451, 515, 516, 517, and 551, plus ACF 213, MN 207, and SC 204.

THE HEALTH SYSTEMS ADMINISTRATION MAJOR. Arts and Sciences students in the Curriculum in Pre-Hospital and Health Services Administration who select this major will take PO 410, 420, 450, 451, 515, 516, and 551, plus ACF 213, 311, 312, and 410.

TOTAL—203 QUARTER HOURS

GROUP REQUISITES

GROUP REQUISITE I. MH 161 or 151.

GROUP REQUISITE II. A 200-level philosophy course.

GROUP REQUISITE III. EH 315 or 390 or SC 211.

A student should become acquainted with the requirements for his major to begin as early as possible the alignment of courses required.

Curricula in Pre-Dental Hygiene (DH), Pre-Occupational Therapy (OT) and Pre-Physical Therapy (PT)

These curricula are designed to prepare students for admission to professional schools. The student should strive for a good college record to attain reasonable promise of being selected.

The student should write for official bulletins from the professional schools of his choice early in his freshman year and discuss with his adviser any special requirements of those particular schools. He should make official application for admission to the professional schools about a year in advance of the expected date of matriculation.

Pre-Dental Hygiene (DH)

FRESHMAN YEAR											
First Quarter				Second Quarter				Third Quarter			
BI 101	Prin. Biol. & Lab.	5		ZY 250	Human Anatomy	5		ZY 251	Physiology	5	
CH 103	Fund. Chem. & Lab.	5		CH 104	Fund. Chem. & Lab.	5		CH 203	Organic Chemistry	5	
HY 101	World History	3		HY 102	World History	3		PG 211	Psychology	5	
EH 101	English Comp.	3		EH 102	English Comp.	3		EH 103	English Comp.	3	

SOPHOMORE YEAR

First Quarter			Second Quarter			Third Quarter		
PG 212	Dev. Psychology	5	SY 201	Intr. Sociology	5	FED 350	Cult. Found. Edu.	5
FED 213	Human Development	5	BY 300	Gen. Microbiology	5	SY 204	Social Behavior	5
NF 318	Nutri. Biochem.	5	FED 300	Edu. Psychology	5		Group Requisite	3
HY 103	World History	3		Group Requisite	3	SC 211	Public Speaking	5

TOTAL—104 QUARTER HOURS

Group Requisite: A minimum of six hours in history, music, literature or art.

Pre-Occupational Therapy (OT)**FRESHMAN YEAR**

First Quarter			Second Quarter			Third Quarter		
BI 101	Prin. Biol. & Lab.	5	ZY 250	Human Anatomy	5	PO 209	American Govt.	5
PG 211	Psychology	5		Group Req. I	5	ZY 251	Physiology	5
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
	ROTC or Elective	1		ROTC or Elective	1		Elective	3
							ROTC or Elective	1

SOPHOMORE YEAR

SY 201	Intr. Sociology	5	SY 202	Social Problems	5	SY 220	Statistics	5
SC 211	Public Speaking	5		Group Req. II	5		Group Req. III	4-5
PG 212	Psychology	5		Group Req. III	5		Elective	3-5
EH 260	Literature	3	EH 261	Literature	3	EH 262	Literature	3
	ROTC or Elective	1		ROTC or Elective	1		ROTC or Elective	1

TOTAL—102 QUARTER HOURS**GROUP REQUISITES**

GROUP REQUISITE I. A course in mathematics, biology, chemistry, or physics.

GROUP REQUISITE II. AT 112 or 121.

GROUP REQUISITE III. An approved course in psychology.

RECOMMENDED ELECTIVES: ANT 203, CH 103-104 and labs., HPR 385, 485, PA 216, PS 200, SY 204, 302, 312.

Students who continue beyond the sophomore year should select courses from alternate group requisites and recommended electives listed above, subject to additional specific requirements of the chosen professional schools. Also recommended are one or more 200-level courses in philosophy and other courses in the humanities and social sciences.

Pre-Physical Therapy (PT)**FRESHMAN YEAR**

First Quarter			Second Quarter			Third Quarter		
CH 103	Fund. Chem. & Lab.	5	CH 104	Fund. Chem. & Lab.	5	PG 211	Psychology	5
MH 160	Pre-Cal. w. Trig.	5	MH 161	An. Geom. & Cal.	5	SY 201	Intr. Sociology	5
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
	Group Requisite	3-5		Group Requisite	3-5		Elective	3-5
	ROTC or Elective	1		ROTC or Elective	1		ROTC or Elective	1

SOPHOMORE YEAR

BI 101	Prin. Biol. & Lab.	5	BI 103	Animal Biol. & Lab.	5	PO 209	American Govt.	5
PG 212	Psychology	3	PG 315	Quant. Methods	5		Group Requisite	3-5
PS 205	Intr. Physics	5	PS 206	Intr. Physics	5		Elective	3-5
EH 260	Literature	3	EH 261	Literature	3	EH 262	Literature	3
	ROTC or Elective	1		ROTC or Elective	1		ROTC or Elective	1

TOTAL—103 QUARTER HOURS

GROUP REQUISITE. A minimum of ten hours in art, foreign language, music, philosophy, speech or theatre.

Students who continue beyond the sophomore year should select courses in the sciences, humanities, and social behavioral sciences, subject to additional specific requirements of the chosen professional schools. Especially recommended are ANT 203, 207; BI 102; BY 300; CH 203 (or CH 207-208); EC 200; MH 162-163; PA 218; PG 330; PO 210; SC 211; SY 201, 202; ZY 250, 251, 300, 301, 302, 310.

Curriculum in Pre-Optometry (OP)

This curriculum leads to a Bachelor of Science degree and is designed to prepare students for the rigorous demands of American optometry schools. The requirements are exacting and demand high scholastic competence and performance. Students must strive for a B-plus four-year college record to attain good promise of being selected by a professional school.

Students with outstanding records who are able to gain admission to an accredited school of optometry before graduation may qualify for the combination B.S. degree by one of the following methods: (1) completing successfully the first nine quarters of this curriculum, a total of 152 quarter hours, plus the freshman year of professional optometry school; or (2) completing successfully the first two years of this curriculum, a total of 107 quarter hours, plus three years of professional optometry school.

The Pre-Optometry student should write for an official bulletin from each of the professional schools of his choice during his freshman year, and discuss with the *Pre-Optometry Adviser* any special requirements of those particular schools. The requirements of all the U.S. schools of optometry are covered in the suggested program below, either as required subjects or as electives. He should take the Optometry College Admission Test and make official application for admission to the professional schools about a year in advance of the expected date of matriculation.

FRESHMAN YEAR											
First Quarter			Second Quarter			Third Quarter					
CH	111	General Chemistry.....	5	CH	112	General Chemistry.....	5	CH	113	General Chemistry.....	5
MH	160	Pre Cal. w. Trig.....	5	MH	161	An. Geom. & Cal.....	5			Group Requisite.....	5
EH	101	English Comp.....	3	EH	102	English Comp.....	3	EH	103	English Comp.....	3
BI	101	Prin. Biol. & Lab.....	5	BI	103	Animal Biol. & Lab.....	5	ZY	103	Cell Biology.....	5
SOPHOMORE YEAR											
HY	101	World History.....	3	HY	102	World History.....	3	HY	103	World History.....	3
CH	207	Organic Chem. & Lab. 5		CH	208	Organic Chem. & Lab. 5				Group Requisite.....	5
PS	205	Intr. Physics.....	5	PS	206	Intr. Physics.....	5	PG	315	Quant. Methods.....	5
PG	211	Psychology.....	5	PG	212	Psychology.....	5			Elective.....	3-5

The student must declare a major by the end of his sixth quarter.

JUNIOR AND SENIOR YEARS

During the junior and senior year the student will complete the following: (a) EH 253, 254, 255 or EH 260, 261, 262 or EH 250, 251; PO 209; (b) requirements of his major, (c) electives to complete the degree requirements of 201 hours. Recommended electives are: BI 102, BY 215, 300, CH 209, EC 200, 202, FL through the first two quarters of the first year sequence as a minimum; IE 204, MH 162, 163, PO 210, PG 330, PS 210, SC 211, SY 201, 202, ZY 251, 300, 301, 302, and/or 300-level or above courses in English, history, philosophy, political science, psychology, and sociology.

TOTAL—201 QUARTER HOURS

Group Requisites: A minimum of ten hours in social and behavioral science (PG, SY, EC, ANT, HY, PO).

A student should become acquainted with the requirements for his major to begin as early as possible the alignment of courses.

Curriculum in Pre-Pharmacy (PPY)

This curriculum meets the requirements for admission to the Auburn University School of Pharmacy, which is fully accredited by the American Council on Pharmaceutical Education. Complete information about the professional curriculum in pharmacy may be found on page 178.

To be considered for admission the applicant must complete the basic 2-year requirements below and must have a 2.00 (C) grade point average based on all courses attempted as well as a 2.00 (C) science index (grade point average on the biological and physical science courses and mathematics). A grade of "D" on any required course will not be accepted. A student who does not qualify for admission to the School of Pharmacy after completion of eight quarters in pre-pharmacy at Auburn University but who meets University continuation in residence requirements may continue to register in pre-pharmacy only by special permission of the Deans of Pharmacy and Arts and Sciences.

FRESHMAN YEAR										
First Quarter				Second Quarter				Third Quarter		
CH 111	General Chemistry	5		CH 112	General Chemistry	5		CH 113	General Chemistry	5
MH 160	Pre-Cal. w. Trig.	5		MH 161	An. Geom. & Cal.	5		BI 101	Prin. Biol. & Lab.	5
EH 101	English Comp.	3		EH 102	English Comp.	3		EH 103	English Comp.	3
HY 101	World History	3		HY 102	World History	3		HY 103	World History	3
	ROTC*	1			ROTC*	1			ROTC*	1
SOPHOMORE YEAR										
CH 207	Organic Chem. & Lab.	5		CH 208	Organic Chem. & Lab.	5			General Elective	3
ZY 250	Human Anatomy	5		PS 206	Intr. Physics	5		SY 201	Intr. Sociology	5
PS 205	Intr. Physics	5		EC 202	Economics II	5		PCS 261	Pharm. Hist. & Orient.	3
MN 207	Intr. Comp. Prod.	3		EHA 304	Tech. Writing	3			Electives**	8

*ROTC optional.

**Elective courses are restricted to courses offered by the Departments of Philosophy and Psychology with no less than one course in each area.

TOTAL—103 QUARTER HOURS

Curriculum in Pre-Veterinary Medicine (PV)

It is preferable to complete this curriculum and earn a baccalaureate degree, although it is possible to gain admission to the School of Veterinary Medicine upon completion of the minimum requirements listed below. The content of the chosen major is the same as in the General Curriculum (see page 84). A student must declare a major by the end of his/her fifth quarter. Upon successful completion of the four-year curriculum, a Bachelor of Science or Bachelor of Arts degree, depending upon the major chosen, will be awarded. If a student is admitted to the School of Veterinary Medicine prior to completion of the full four years, he/she may obtain a Bachelor of Science degree by successfully completing the first nine quarters of this curriculum plus successfully completing the freshman year of the School of Veterinary Medicine.

The student will be guided by the *Pre-Veterinary Medicine Adviser* regarding this curriculum and by an adviser in the department of his/her major regarding the major subject.

The *minimum* requirements for admission to the School of Veterinary Medicine, Auburn University (128 quarter hours) are as follows (and are also incorporated in the curriculum model below):

EH 101-102-103	9	MH 160-161	10	ADS 200	5	PO 209	5
EH 141	3	BI 101-102-103	15	ADS 220	5	Humanities,	
HY 101-102-103	9	CH 103-104-105	15	ADS 320	4	Fine Arts,	
		CH 207-208	10	BY 300	5	and Social	
		PS 205-206	10	ZY 300	5	Sciences	15

APPLICATION FOR ADMISSION to the School of Veterinary Medicine must be submitted to the Dean of that school between September 15 and October 15 preceding the admission date. A minimum grade point average of 2.50 is required for application; D grades in required academic courses are not acceptable. All minimum course requirements must be completed by the end of the spring quarter preceding the date of admission, and all advanced required courses in physical and biological science categories (organic chemistry, physics, microbiology, and genetics) must have been completed within six calendar years prior to the anticipated entrance date. Completion of this curriculum does not guarantee admission to a professional school of veterinary medicine. Competition for admission to the professional schools is keen with the number of qualified applicants exceeding the number of places available. (For further information, see School of Veterinary Medicine in the *Auburn University Bulletin*.)

See also Pre-Veterinary Medicine option, Animal and Dairy Sciences curriculum, School of Agriculture.

FRESHMAN YEAR								
First Quarter			Second Quarter			Third Quarter		
CH 103	Fund. Chem. & Lab.	5	CH 104	Fund. Chem. & Lab.	5	CH 105	Fund. Chem. & Lab.	5
MH 160	Pre-Cal. w/Trig.	5	MH 161	An. Geom. & Cal.	5	PS 205	Intr. Physics	5
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
HY 101	World History	3	HY 102	World History	3	HY 103	World History	3
SOPHOMORE YEAR								
BI 101	Prin. Biol. & Lab.	5	BI 102	Plant Biology	5	BI 103	Animal Biol. & Lab.	5
PS 206	Intr. Physics	5	CH 207	Org. Chem. & Lab.	5	CH 208	Organic Chem. & Lab.	5
ADS 200	Intr. Animal & Dairy Science	5	ADS 220	Anim. Biochem. & Nut. Group Requisite I**	3	PO 209	American Govt. Group Requisite I	5
EH 141	Medical Vocabulary*	3						3

JUNIOR YEAR		
BY 300	First Quarter	
	Gen. Microbiology.....5	
	Major.....5	
	Elective.....5	
	Group Requisite I.....3	
ZY 300	Second Quarter	
	Genetics.....5	
	Major.....5	
	Elective.....3	
	Group Requisite I.....3	
SENIOR YEAR		
	Major.....5	
	Major.....5	
	Elective.....5	
ADS 320	Third Quarter	
	Feeds and Feeding.....4	
	Major.....5	
	Elective.....5	
	Group Requisite I.....3	
	Major.....5	
	Major.....5	
	Elective.....5	

*Or a foreign language through the first year sequence.

**GROUP REQUISITE I. These requisites must be earned in humanities, fine arts, and social sciences.

TOTAL—201 QUARTER HOURS

Special Curricula

Special curricula leading to the Bachelor of Science degree include chemistry, chemistry with biochemistry option, criminal justice, criminology, geology, laboratory and medical technology, mathematics, applied mathematics, physics, applied physics, and public administration. The Bachelor of Arts degree may be earned in the Special Curriculum in Foreign Languages-International Trade, the Special Curriculum in Public Relations, the Special Curriculum in Latin American Studies, and the Special Curriculum in Spanish and Social Work.

Curriculum in Chemistry (CH)

This American Chemical Society accredited curriculum prepares students for careers in both pure and applied chemistry with a dual emphasis on classroom and laboratory experience. A flexible senior year allows students to tailor the program to their individual professional goals. Graduates will be prepared to enter the profession immediately or continue for advanced degree programs. The senior research program is designed to introduce students to modern advanced techniques and approaches to chemical research in an area of their interests by doing an individual research project in conjunction with a faculty adviser.

FRESHMAN YEAR		
CH 111	First Quarter	
	General Chem. & Lab. .5	
	An. Geom. & Cal. .5	
	English Comp. .3	
MH 161	Second Quarter	
	General Chem. & Lab. .5	
	An. Geom. & Cal. .5	
	English Comp. .3	
EH 101	Third Quarter	
	General Chem. & Lab. .5	
	An. Geom. & Cal. .5	
	English Comp. .3	
HY 101	World History.....3	
	ROTC or Elective.....1	
SOPHOMORE YEAR		
CH 205	Organic Chem. .5	
	Group Requisite .5	
	Gen. Physics II .4	
	Lin. Diff. Equations .3	
CH 304	Organic Chem. .5	
	Group Requisite .5	
	Gen. Physics II .4	
	Lin. Diff. Equations .3	
PS 220	Organic Chem. .5	
	Group Requisite .5	
	Gen. Physics II .4	
	Lin. Diff. Equations .3	
MH 265	Organic Chem. .5	
	Group Requisite .5	
	Gen. Physics II .4	
	Lin. Diff. Equations .3	
JUNIOR YEAR		
CH 507	Physical Chem. .5	
	German** .5	
	Gen. Physics III .4	
	Approved Elective*** .3	
FL 222	Physical Chem. .5	
	German** .5	
	Gen. Physics III .4	
	Approved Elective*** .3	
PS 305	Organic Chem. .5	
	Approved Elective .3-5	
	Gen. Physics II .4	
	Topics Linear Algebra .3	
MH 266	Organic Chem. .5	
	Approved Elective .3-5	
	Gen. Physics II .4	
	Topics Linear Algebra .3	
CH 509	Physical Chemistry .5	
	German** .5	
	Modern Physics .5	
	Approved Elective .3	
FL 305	Physical Chemistry .5	
	German** .5	
	Modern Physics .5	
	Approved Elective .3	

SENIOR YEAR

Students will work out with their departmental advisers a program of study to meet their personal professional goals. Included in this program will be: CH 510 - Intermediate Inorganic Chemistry - 5; CH 490 - Special Problems in Chemistry - 5; and 15 credit hours selected from the following courses:

CH 504	Intr. to Molec. Orbital Methods.....	5	CH 516	Polymer Tech. II.....	3
CH 511	Inter. Inorgan. Chem. II.....	5	CH 518	Biochemistry.....	5
CH 512	Chem. Thermody.....	5	CH 519	Biochemistry.....	5
CH 515	Polymer Tech. I.....	4	CH 520	Clin. Biochemistry.....	5

Additional technical and general electives will be selected to complete 205 credit hours.

*Students not prepared for MH 161 must take MH 160 without credit.

**German through the first year sequence. (See page 257.)

***A maximum of six hours of advanced ROTC may be substituted for electives in the junior or senior year. Students will be certified to the American Chemical Society as Certified Graduates when they have made up the electives for which advanced ROTC was substituted.

TOTAL—205 QUARTER HOURS

GROUP REQUISITE. EC 200, PO 209, or SY 201.

APPROVED ELECTIVES

EC 200	General Economics.....	5	HY 202	History of U.S.....	5
EC 206	Socio-Economic Foundations of Contemporary America.....	3	MU 373	Appreciation of Music.....	3
EH 253-254-255 or EH 260-261-262.....		3-3-3	MU 374	Masterpieces of Music.....	3
EH 350	Shakespeare's Greatest Plays.....	3	PO 209	American Government.....	5
EH 365	Southern Literature.....	3	PG 211	Psychology.....	5
GY 303	Geography of the Soviet Union.....	3	SY 201	Introduction to Sociology.....	5
HY 201	History of U.S.....	5	TH 210	Theatre as Entertainment.....	3

Alternate Curriculum in Chemistry (BCH)

Biochemistry Option

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
CH 111	General Chemistry.....	5	CH 112	General Chemistry.....	5	CH 113	General Chemistry.....	5
MH 161	An. Geom. & Cal.*.....	5	MH 162	An. Geom. & Cal.....	5	MH 163	An. Geom. & Cal.....	5
EH 101	English Comp.....	3	EH 102	English Comp.....	3	EH 103	English Comp.....	3
HY 101	World History.....	3	HY 102	World History.....	3	HY 103	World History.....	3
	ROTC or Elective.....	1		ROTC or Elective.....	1		ROTC or Elective.....	1

SOPHOMORE YEAR

EH 390	Adv. Comp.....	5	CH 205	An. Chem. & Lab.....	5	BI 101	Prin. of Biol. & Lab.....	5
MH 264	An. Geom. & Cal.....	5	PS 221	Gen. Physics II.....	4	CH 303	Organic Chemistry.....	5
PS 220	Gen. Physics I.....	4	MH 265	Lin. Diff. Equations.....	3	PS 222	Gen. Physics III.....	4
	ROTC or Elective.....	1		Elective.....	3		ROTC or Elective.....	1
				ROTC or Elective.....	1			

JUNIOR YEAR

BI 103	Animal Biol. & Lab.....	5	CH 305	Organic Chemistry.....	5	CH 509	Physical Chemistry.....	5
CH 304	Organic Chemistry.....	5	CH 508	Physical Chemistry.....	5	BY 300	Gen. Microbiology.....	5
CH 507	Physical Chemistry.....	5	ZY 301	Compar. Anatomy.....	5	ZY 524	Animal Physiology.....	5
	Approved Elective.....	3		Approved Elective.....	3		Approved Elective.....	3

SENIOR YEAR

CH 518	Biochemistry.....	5	CH 519	Biochemistry.....	5	CH 520	Clin. Biochemistry.....	5
FL	German**.....	5	FL	German**.....	5		German**.....	5
	Group Req.....	5	CH 513	An. Chem.....	5		Approved Elective.....	3-5
	Approved Elective.....	3		Approved Elective.....	3		Approved Elective.....	3

*Students not prepared for MH 161 must take 160 without credit.

**German through the first year sequence. (See page 257.)

TOTAL—204 QUARTER HOURS

GROUP REQUISITE. EC 200, PO 209, or SY 201.

APPROVED ELECTIVES

EC 200	General Economics.....	5	HY 202	History of U.S.....	5
EC 206	Socio-Economic Foundations of Contemporary America.....	3	MU 373	Appreciation of Music.....	3
EH 253-254-255 or EH 260-261-262.....		3-3-3	MU 374	Masterpieces of Music.....	3
EH 350	Shakespeare's Greatest Plays.....	3	PO 209	American Government.....	5
EH 365	Southern Literature.....	3	PG 211	Psychology.....	5
GY 303	Geography of the Soviet Union.....	3	SY 201	Introduction to Sociology.....	5
HY 201	History of U.S.....	5	TH 210	Theatre as Entertainment.....	3

Curriculum in Criminal Justice (CJ)

This curriculum prepares students for professional careers in criminal justice agencies at all levels of government. It offers two alternative specializations: *Law Enforcement*; or *Offender Rehabilitation* with options in either adult corrections or youth services.

The curriculum is administered by the Department of Political Science. This curriculum model does not show all the possible variations; students should consult the *Criminal Justice Adviser* before enrolling.

FRESHMAN YEAR									
First Quarter			Second Quarter			Third Quarter			
		Group Req. I.....	3-5		Group Req. I.....	3-5		Group Req. I.....	3-5
		Group Req. II.....	3-5		Group Req. II.....	4-5		Group Req. III.....	4-5
EH 101		English Comp.....	3	EH 102	English Comp.....	3	EH 103	English Comp.....	3
HY 101		World History.....	3	HY 102	World History.....	3	HY 103	World History.....	3
		ROTC or Elective.....	1		ROTC or Elective.....	1		ROTC or Elective.....	1
PE		Physical Education.....	1	PE	Physical Education.....	1	PE	Physical Education.....	1
SOPHOMORE YEAR									
ACF 211	or 215 Acct.**.....	4	PO 210	State & Loc. Govt.....	5	EC 200	Economics I.....	5	
PO 209	American Govt.....	5	SY 201	Intr. Sociology.....	5	LE 260	Surv. of Law Enf.....	5	
PG 211	Psychology.....	5		Group Req. III.....	3-5	SC	202 or 211.....	3-5	
EH	Literature**.....	3	EH	Literature**.....	3	EH	Literature**.....	3	
	ROTC or Elective.....	1		ROTC or Elective.....	1		ROTC or Elective.....	1	

*PE requisites: **Second Quarter.** PE 130, 132, PE 134, or 131. **Third Quarter.** PE 162, 150, 230, or 231, or 102, or 103 as required.

**The student in *youth services specialization* will substitute LE 335.

***EH 253-254-255 or EH 260-261-262 or EH 250-251.

JUNIOR AND SENIOR YEARS

Students in both the *law enforcement specialization* and the *offender rehabilitation specialization* will complete EHA 307; HPR 351 or 396 or 494 or 597; LE 262, 270, 335, 464; PG 301 or 536; SY 204 or PG 330 or PG 212; SY 308 or 304 or 520; SY 302, PO 325 or 327; PO 501 and 502 (PO 332 may be taken in lieu of 501, or PO 336 may be taken in lieu of 502, but in any case either PO 501 or 502 must be taken).

The student in the *law enforcement specialization* will complete LE 261, 361, 363, 461; PO 323 or 505 or 518; PO 515 or PO 410; and SY 505 or 525 or PG 435. The student in the *offender rehabilitation specialization* will complete CED 521, HPR 597 or 396; SW 375; three courses from SY 304, 525, 526, 530, PG 435.

TOTAL—201 QUARTER HOURS

GROUP REQUISITE I. The student should take a minimum of ten hours in mathematics, or ten hours in philosophy, or ten hours in mathematics and philosophy, choosing the mathematics course or courses from MH 100, 140 or 160, 155, 161, 162, 163, and choosing the philosophy course or courses from PA 202, 210, 211, 212, 214, 216. Any mathematics or philosophy courses which are requisites to the student's major program will apply in fulfillment of this Group Requisite as well. Group Requisite I may be completed in either two or three quarters, depending upon the combination of courses chosen.

GROUP REQUISITE II. A minimum of 10 hours in one science, including corresponding laboratories, from the following: BI 101-102, 101-103, 101-104, BI 101-BY 201, CH 101-102-104 or 103-104 or 111-112-113, GL 101-102, 110-103, PS 205-206, 220-221-222, PHS 100-101.

GROUP REQUISITE III. A minimum of 9 hours in Ascent of Man series, art, foreign language, geography, literature, music, philosophy, religion, or theatre courses.

Curriculum in Criminology (SCR)

The curriculum in criminology represents a broad range of study and pre-professional preparation. The focus of study is upon the etiology of crime and society's reaction to it. The area more specifically emphasizes the sociology of law, research on crime and delinquency and theoretical developments in criminality and juvenile delinquency.

This curriculum prepares students to fill state level positions requiring planning and research skills dealing with various types of offenders and their dispositions and also provides the student the requisite skills for graduate study in the field of criminology.

The curriculum is administered by the Department of Sociology and Anthropology.

FRESHMAN YEAR									
First Quarter			Second Quarter			Third Quarter			
		Group Requisite I.....	3-5		Group Requisite I.....	3-5		Group Requisite I.....	3-5
		Group Requisite II.....	4-5		Group Requisite II.....	4-5		Group Requisite III.....	4-5
EH 101		English Comp.....	3	EH 102	English Comp.....	3	EH 103	English Comp.....	3
HY 101		World History.....	3	HY 102	World History.....	3	HY 103	World History.....	3
		ROTC or Elective.....	1		ROTC or Elective.....	1		ROTC or Elective.....	1

SOPHOMORE YEAR

First Quarter			Second Quarter			Third Quarter		
PO	209	American Govt. ....5	PO	210	State & Loc. Govt. ....5	PG	301	Psych. in Crim. Just. ....5
SY	201	Intr. Sociology ....5	ANT	203	Intr. Anthropology ....5	PO	336	Criminal Justice** ....3
EH		Group Requisite III. ....4-5	PG	211	Psychology ....5	FCD	157	Family & Human Dev. ....3
		Literature* ....3	EH		Literature ....3	EH		Literature ....3
		ROTC or Elective ....1			ROTC or Elective ....1			ROTC or Elective ....1

*EH 253-254-255 or EH 260-261-262 or EH 250-251.

**PO 502 may be substituted.

JUNIOR AND SENIOR YEARS

Students in Criminology specialization will complete SY 220, 502, 370, 302, 308, 526, and 530. The following are recommended electives: SY 304, 505, 525, 515, and 520; ANT 206, 305, and 512. The student may choose any minors but the following are recommended: a minor in criminal justice-law enforcement from the following courses: LE 260, 261, 262, 335, 361, 363 and 461 and a minor in Political Science from the following courses: PO 330, 331, 332, 333, 340, 410, 501, 502, 518 and 540.

TOTAL—201 QUARTER HOURS

GROUP REQUISITES

GROUP REQUISITE I. The Student should take a minimum of ten hours in mathematics, or ten hours in philosophy, or ten hours in mathematics and philosophy, choosing the mathematics course or courses from MH 100, 140 or 160 not both, 155, 161, 162, 163, and choosing the philosophy course or courses from PA 202, 210, 211, 212, 214, 216. Any mathematics or philosophy courses which are requisite to the student's major program will apply in fulfillment of this Group Requisite as well. Group Requisite I may be completed in either two or three quarters, depending upon the combination of courses chosen.

GROUP REQUISITE II. A minimum of 10 hours in one science, including corresponding laboratories, from the following: BI 101-102, 101-103, 101-104, BI 101-BY 201, CH 101-102-104 or 103-104 or 111-112-113; GL 101-102, 110-103; PS 205-206, 220-221-222, PHS 100-101.

GROUP REQUISITE III. A minimum of 9 hours in art, foreign languages, geography, literature, music, philosophy, religion, or theatre courses.

Curriculum in Foreign Languages—International Trade (FLT)

The curriculum enables students to combine foreign language studies in French, German, and Spanish with specifically selected business subjects, in order to open a broad variety of possible career opportunities. Such preparation also affords them the choice of graduate or other advanced study in either field, be it in universities or in specialized language or business institutes. This curriculum, especially if continued at the graduate level, can lead to government or teaching employment from federal and state service through university and junior college. Primary career application may be found with national or international firms engaged in foreign trade (within the United States or abroad), in the transportation and hotel industries, in international brokerage houses, and in a number of foreign trade management, public relations, and documentation/translation positions.

The following four-year program satisfies the requirements for graduation with a Bachelor of Arts degree in foreign languages (French, German, Spanish). See also Foreign Language Major and Minor under Majors and Minors in the General Curriculum, page 84.

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
FL		First Yr. Lang. I. ....5	FL		First Yr. Lang. II. ....5	FL		First Yr. Lang. III. ....5
EH	101	English Comp. ....3	EH	102	English Comp. ....3	EH	103	English Comp. ....3
HY	101	World History ....3	HY	102	World History ....3	HY	103	World History ....3
MH	140	or 160 Algebra or Alg./Trig. ....5	MH	151	or 161 Finite or Cal. ....5	SY	201	Intr. Sociology ....5

SOPHOMORE YEAR

First Quarter			Second Quarter			Third Quarter		
FL		Sec. Yr. Lang. I. ....5	FL		Sec. Yr. Lang. II. ....5	FL		Sec. Yr. Lang. III. ....5
EC	200	Science* ....5	EC	202	Science* ....5	PO	209	American Govt. ....5
EH	260	Economics I. ....5	EH	261	Economics II. ....5	ACF	211	Accounting I. ....4
		World Lit. I. ....3			World Lit. II. ....3	EH	262	World Lit. III. ....3

JUNIOR YEAR									
First Quarter			Second Quarter			Third Quarter			
FL		Conversation.....3	FL		Composition.....3	FL		Civilization.....3	
PO	210	State & Local Govt.....5	MT	331	Prin. of Mktg.....5	MN	310	Prin. of Mgt.....4	
ACF	212	Accounting II.....4	GY	302	Econ. Geog.....5	ACF	361	Business Finance.....5	
EHA	315	B & P Rpt. Writing.....3	MN	207	Data Processing.....3	MT	341	Consumer Behavior.....5	
			EH	415	Written Bus. Comm.....3				
SENIOR YEAR									
FL		Elective**.....3	FL		Elective**.....3	FL		520, 430, 450.....3	
MT	440	International Mktg.....5	FL		329-339-359.....3	EC	571	Intern. Economics.....5	
		Intern. Trade Elec.....5			A & S Elective**.....5			A & S Elective.....5	
		General Elective.....3			General Elective.....5			General Elective.....3	

*10 hours from the following approved electives: BI 101-102, 101-103, 101-104, BI 101-BY 201, CH 101-102-104, 103-104, GL 101-102, 101-103, 110-103, PS 205-206, PS 220-221-222, PHS 100-101.

**300-level or above elective.

***10 hours from the following approved electives: GY 102, 215, 303, 304, 305, 306, 307, 308, 401, HY 300, 301, 355, 380, 527, 528, 529, 533, 535, 536, 544, 545, 552, 554, 555, 572, PO 309, 311, 312, 314, 318, 445, 526, 535, 539, 540, RL 230, 301, SY 520, ANT 305, 511 or another foreign language.

Students may take no more than 25 percent of degree requirements in courses offered by the School of Business. This does not include the two courses in Economics, EC 200 and 202.

TOTAL—201 QUARTER HOURS

Curriculum in Geology (GL)

This curriculum prepares the student broadly in all aspects of geological processes and principles. This should enable him to make a more intelligent selection of employment or of a graduate program of study that will permit specialization in one or more of the many aspects of the science. Employment for the geologist ranges from federal and state service through university or college and industrial programs to private consulting.

The following four-year program satisfies the requirements for graduation with a Bachelor of Science degree in geology. (See also Earth Sciences major under Majors and Minors in the General Curriculum, page 85.)

FRESHMAN YEAR														
First Quarter					Second Quarter					Third Quarter				
BI	101	Prin. of Biol. & Lab.....	5		BI	102	Plant Biology.....	5		BI	103	Animal Biol. & Lab.....	5	
GL	110	Physical Geology.....	5		GL	103	Historical Geology.....	5		MH	161	An. Geom. & Cal.....	5	
EH	101	English Comp.....	3		EH	102	English Comp.....	3		EH	103	English Comp.....	3	
HY	101	World History.....	3		HY	102	World History.....	3		HY	103	World History.....	3	
		ROTC or Elective.....	1				ROTC or Elective.....	1				ROTC or Elective.....	1	
SOPHOMORE YEAR*														
CH	103	Chemistry & Lab.....	5		CH	104	Chemistry & Lab.....	5		CH	105	Chemistry & Lab.....	5	
GL	205	Paleobotany.....	5		GL	206	Invert. Paleozoology.....	5		GL	240	Struct. & Geotect.....	5	
MH	162	An. Geom. & Cal.....	5		MH	163	An. Geom. & Cal.....	5		PO	209	American Govt.....	5	
EH		Literature**.....	3		EH		Literature**.....	3		EH		Literature**.....	3	
JUNIOR YEAR														
GL	301	Mineralogy.....	5		GL	302	Optical Mineralogy.....	5		GL	305	Ign. & Met. Pet.....	5	
PS	205	Intr. Physics I.....	5		PS	206	Intr. Physics II.....	5		PO	210	State & Local Govt.....	5	
		Minor I.....	5				Minor I.....	5				Minor I.....	5	
SENIOR YEAR														
GL	401	Sed. Pet.....	5		GL	411	Stratigraphy.....	5		GL	421	Economic Geology.....	5	
		Group Requisite.....	5				Minor II.....	5				Minor II.....	5	
		Minor II.....	5				Elective.....	5				Elective.....	3-5	

*During the Summer Quarter following the second year, the student should take GL 215 (4) and TS 102 (2).

**EH 253-254-255 or 260-261-262 or 250-251.

TOTAL—202 QUARTER HOURS

GROUP REQUISITES AND MINORS

GROUP REQUISITE. A course in music, theatre, art, speech communication, journalism, economics, psychology or religion.

MINORS. Two 15-hour minors (or one 30-hour double minor) should be selected from those under the General Curriculum with the advice and approval of the student's departmental adviser. Students planning a minor in chemistry, civil engineering, or physics should also plan a second minor in mathematics.

Curriculum in Laboratory Technology (LT) and Medical Technology (MDT)

This curriculum, leading to the degree of Bachelor of Science in Laboratory Technology or Medical Technology, is designed for men and women who wish to prepare for clinical and other laboratory positions in such fields as public health and bacteriology. Most of the graduates in this curriculum enter the field of clinical medicine as medical technologists. They should plan to attain status as Registered Medical Technologists by interning for one year in an approved hospital and then passing the National Registry of Medical Technologists written examination.

The *Medical Technology option* leads to the Bachelor of Science degree in Medical Technology (conferred by Auburn University). Degree requirements include successful completion of nine quarters of the laboratory technology curriculum and one year's satisfactory training in a hospital school of medical technology approved by the National Accrediting Agency of Clinical Laboratory Sciences and by the Head of the Department of Chemistry at Auburn University. (See Medical Technology Option below.) Graduates of this curriculum should plan to attain status as Certified Medical Technologists by passing the National Certification Examination.

Further requirements include: (1) Auburn University students transferring into medical technology must complete in the laboratory technology curriculum one academic year (54 hours) preceding the year of internship. (2) Transfers from other institutions who choose the medical technology option must complete the third year of the laboratory technology curriculum at Auburn prior to internship.

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
CH 111	Gen. Chem. & Lab.	5	BI 101	Prin. Biol. & Lab.	5	BI 103	Animal Biol. & Lab.	5
MH 160	Pre-Cal. w. Trig.	5	CH 112	Gen. Chem. & Lab.	5	CH 113	Gen. Chem. & Lab.	5
EH 101	English Comp.	3	EH 102	English Comp.	3	MH 161	An. Geom. & Cal.	5
HY 101	World History	3	HY 102	World History	3	EH 103	English Comp.	3
LT 101	Orientation	1						

SOPHOMORE YEAR

CH 207	Organic Chem. & Lab.	5	CH 208	Organic Chem. & Lab.	5	CH 204	An. Chem. & Lab.	5
PS 205	Intr. Physics I.	5	PS 206	Intr. Physics II.	5	BY 300	Gen. Microbiology	5
HY 103	World History	3	ZY 250	Human Anatomy	5	ZY 251	Physiology	5
HPR 195	Health Science	3		Elective	3			

JUNIOR YEAR

CH 301	Biochemistry	5	CH 302	Biochemistry	5	CH 520	Clin. Biochemistry	5
LT 301	Hematology	5	LT 404	Immunology I.	5	LT 401	Adv. Hematology	5
BY 446	Clin. Microbiology	5	ZY 511	Gen. Parasitology	5		Group Requisite I	5
HY 306	Contemp. Affairs	3					Elective	5

SENIOR YEAR

ZY 308	Micrology	5	ZY 509	Histology	5	LT 405	Immunology II	5
EHA 304	Technical Writing	3	SC 202	App. Sp. Comm.	3		Group Requisite II	5
	Elective	6		Elective	10		Elective	5
LT 525	Clin. Inst.	5						

Medical Technology Option—12 Months

SENIOR YEAR

MDT 406	Ci. Hematology	12	MDT 402	Ci. Microbiol.	10	MDT 425	Chemistry	16
MDT 408	Immunohematology	4	MDT 405	Ci. Parasitology	3	MDT 401	Urinalysis	3
			MDT 407	Ci. Serology	3			

TOTAL—205 QUARTER HOURS

GROUP REQUISITE I, EC 200, PO 209, or SY 201.

GROUP REQUISITE II, ZY 300, 310, or 524.

APPROVED ELECTIVES

EC 200 General Economics.....	5	HY 201 History of U.S.....	5
EC 206 Socio-Economic Foundations of Contemporary America.....	3	HY 202 History of U.S.....	5
EH 253-254-255 or EH 260-261-262.....	3-3-3	MU 373 Appreciation of Music.....	3
EH 350 Shakespeare's Greatest Plays.....	3	MU 374 Masterpieces of Music.....	3
EH 365 Southern Literature.....	3	PO 209 American Government.....	5
FL* French or German.....	5-5	PG 211 Psychology.....	5
GY 303 Soviet Union, Land & People.....	5	SY 201 Introduction to Sociology.....	5
		TH 210 Theatre as Entertainment.....	3

*French or German through the first two quarters of the first year sequence as a minimum. (See pages 256-257.)

Curriculum in Mathematics (MH)

This curriculum is designed to prepare students for graduate study and eventual careers as mathematicians. In order to graduate with a major in mathematics, a student must have an overall C average or better in all mathematics courses attempted which are required for the major, above the 100-level, and for which a grade other than W has been assigned. The General Curriculum should be used by students who prefer flexibility in the design of their program (see page 84).

FRESHMAN YEAR

First Quarter		Second Quarter		Third Quarter	
FL	Foreign Language*.....5	FL	Foreign Language*.....5	FL	Foreign Language*.....5
MH 161	An. Geom. & Cal.*.....5	MH 162	An. Geom. & Cal.*.....5	MH 163	An. Geom. & Cal.*.....5
EH 101	English Comp.....3	EH 102	English Comp.....3	EH 103	English Comp.....3
HY 101	World History.....3	HY 102	World History.....3	HY 103	World History.....3
	ROTC or Elective.....1		ROTC or Elective.....1		ROTC or Elective.....1

SOPHOMORE YEAR

MH 264	An. Geom. & Cal.....5	MH 265	Lin. Diff. Equations.....3	MH 331	Intr. Mod. Alg. I.....5
	Natural Science†.....4-5	MH 266	Top. in Lin. Alg.....3		Natural Science.....4-5
EH	Literature††.....3		Natural Science.....4-5	EH	Literature††.....3
	ROTC or Elective.....1	EH	Literature††.....3		ROTC or Elective.....1
			ROTC or Elective.....1		

JUNIOR YEAR

FL	Foreign Language*.....5	FL	Foreign Language*.....5	FL	Foreign Language*.....5
MH 332	Intr. Mod. Alg. II.....5	MH 531	Intr. Mod. Alg. III.....5	MH 521	Analysis II.....5
	Elective†††.....3	MH 520	Analysis I.....5		Requisite.....3-5
	Elective.....3		Elective.....3		Elective.....3

SENIOR YEAR

MH 522	Analysis III.....5	MH	Requisite.....5	MH	Requisite.....5
	Requisite.....3-5		Group Requisite.....5		Group Requisite.....5
MH	Elective.....5		Elective.....5		Elective.....5
	Elective.....3		Elective.....3		Elective.....3

*Completion of two languages, French, German, Russian, through the first year sequence or one of these languages through the second year sequence. (See pages 256-257-258.)

**Students not prepared for MH 161 must take MH 160 without credit.

†The natural science requirement may be met by taking PS 220-221-222 or CH 111-112-113. If the 12-hour physics sequence is selected, an additional 3-hour elective will be needed to meet the 196-hour requirement.

††EH 253-254-255 or 260-261-262.

†††Appropriate electives to meet the interests of the student may be selected in consultation with his departmental adviser.

TOTAL—196 QUARTER HOURS

GROUP REQUISITES

GROUP REQUISITES. These requisites are chosen from one of the following areas of social science: economics, education, history, political science, psychology, or sociology.

Curriculum in Applied Mathematics (AMH)

An important feature of this curriculum is the option for the student to concentrate, by means of technical electives, on an important area to which mathematics can be applied: one of the traditionally allied fields such as engineering, physical science, or computer

science; or the more recently allied areas such as biology (ecological systems, cell models), behavioral science or managerial science. In order to graduate with a major in mathematics, a student must have an overall C average or better in all mathematics courses attempted which are required for the major, above the 100-level, and for which a grade other than W has been assigned.

This is a professional mathematics curriculum. Students who desire more flexibility or more emphasis on the liberal arts should pursue the GMH or MH curriculum.

FRESHMAN YEAR

First Quarter		Second Quarter		Third Quarter	
MH 161	An. Geom. & Cal. ....5	MH 162	An. Geom. & Cal. ....5	MH 163	An. Geom. & Cal. ....5
CH 103	Fund. Chem. & Lab. or	CH 104	Fund. Chem. & Lab. or	PS 220	Gen. Physics I .....4
BI 101	Prin. Biol. & Lab. ....5	BI 102	Plant Biology or	EH 103	English Comp. ....3
EH 101	English Comp. ....3	BI 103	Animal Biology or	HY 103	World History .....3
HY 101	World History .....3	BI 104	Biology in Human	MH 173	Cal. Lab. ....1
MH 171	Cal. Lab. ....1		Affairs .....5		ROTC or Elective .....1
	ROTC or Elective .....1	EH 102	English Comp. ....3		
		HY 102	World History .....3		
		MH 172	Cal. Lab. ....1		
			ROTC or Elective .....1		

SOPHOMORE YEAR

MH 264	Anal. Geom. & Calculus .....5	MH 269	Elem. Differential Equations .....5	MH 332	Intr. Modern Algebra II .....5
PH 221	General Physics II .....4	PS 222	General Physics III .....4		Group Requisite I .....5
MH 271	Intr. Math. Programming .....3	MH 331	Intr. Modern Algebra I .....5		Group Requisite II .....5
	Group Requisite II .....3		Group Requisite II .....3		

JUNIOR YEAR

MH 520	Analysis I .....5	MH 521	Analysis II .....5	MH 522	Analysis III .....5
MH 337	Intr. Linear Algebra .....5	MH 568	Math. Statistics II .....5		Group Requisite I .....5
MH 567	Math Statistics I .....5		Group Requisite I .....5		Group Requisite II .....3
	Elective .....3		Group Requisite II .....3		Applied Math. Requisite .....3

SENIOR YEAR

MH 560	Intr. Numerical Analysis .....5	MH 551	Numerical Matrix Analysis .....5		Applied Math. Requisite .....6
	Applied Math. Requisite .....3		Applied Math. Requisite .....3		Group Requisite I .....5
	Group Requisite II .....3		Group Requisite I .....5		Elective .....3
	Elective .....5		Elective .....3		Humanities Elective .....3

*Students not prepared for MH 161 must take MH 160 without credit.

TOTAL—201 QUARTER HOURS

APPLIED MATHEMATICS REQUISITES

Five courses for a total of a minimum of 15 hours of credit must be taken in the area of applied mathematics. This credit may be earned by taking courses selected, in consultation with a department adviser, from the following: MH 362, 501, 502, 503, 505, 506, 507, 510, 511, 515, 524, 528, 529, 531, 537, 569, 571, 573, 574, 575.

GROUP REQUISITE I

A minimum of 25 hours of requisite credit must be taken in areas especially concerned with the application of mathematics. At least 15 hours must be taken in the same area. The primary areas for such concentration are:

Botany-Zoology	Physics	Civil Engineering
Chemistry	Psychology	Computer Science and Engineering
Economics	Aerospace Engineering	Electrical Engineering
Geology	Chemical Engineering	Industrial Engineering
		Mechanical Engineering

Lists of acceptable courses in each of these areas are available through the Departmental Office.

Computer Science Concentration

The courses recommended for students who wish a concentration in computer science are IE 301, 384, 385, 555, 585, 587, 588, and EE 330, 335, 430, 527, 528.

GROUP REQUISITE II

A minimum of 20 hours of requisite credit must be taken in the social sciences area and in the humanities and fine arts area with at least one course in each of the two areas. Students planning graduate study beyond the Master's level should include a foreign language in Group Requisite II; in such case they must also take a social science course of at least five hours credit.

Curriculum in Physics (PS)

This curriculum provides a thorough understanding of the field of physics and develops the ability to apply theoretical and experimental techniques to a wide range of problems. It provides a firm foundation for careers in physics and related fields and an excellent preparation for further graduate study.

Graduates find opportunities in industrial and government research and development; chemical, geological, biological and mathematical physics; medical and dental research; environmental science; and teaching and/or research to the college or university level.

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
CH 111	General Chemistry	5	CH 112	General Chemistry	5	CH 113	General Chemistry	5
MH 161	An. Geom. & Cal.*	5	MH 162	An. Geom. & Cal.	5	MH 163	An. Geom. & Cal.	5
EH 101	English Comp.	3	EH 102	English Comp.	3	PS 220	General Physics I	4
HY 204	Technology & Civil**	3	HY 205	Technology & Civil**	3	HY 206	Technology & Civil**	3
	ROTC or Elective	1		ROTC or Elective	1		ROTC or Elective	1
	Elective	1		Elective	1		Elective	1

SOPHOMORE YEAR

MH 264	An. Geom. & Cal.	5	MH 269	Elem. Diff. Equations	5	PS 302	Electronics	5
PS 221	General Physics II	4	PS 222	General Physics III	4	PS 305	Intr. Modern Physics	4
EH 103	English Comp.	3	IE 204	Computer Programming	3	MH 362	Engineering Math I	3
	Elective	5		Group Requisite	5		Elective	3
	ROTC or Elective	1		ROTC or Elective	1		ROTC or Elective	1

JUNIOR YEAR

PS 300	Electricity & Magnet.	4	PS 501	Mechanics I	5	PS 502	Mechanics II	5
MH 501	Vector Calculus	3	PS 301	Electricity and Magnet.	4	PS 303	Optics	4
	Group Requisite	5	PS 306	Physics Laboratory	2	MH 506	Partial Diff. Equal.	3
	Elective	5		Group Requisite	5		Group Requisite	5

SENIOR YEAR

PS 515	Modern Physics I	5	PS 516	Modern Physics II	5	PS 507	Exp. Physics II	2
PS 506	Exp. Physics I	2	PS 504	Stat. Thermodynamics	5	PS 520	Nuclear & Elem. Part.	5
	Physics Elective	3		Physics Elective	3		Elective	5
	Electives	7		Elective	3		Elective	5

*Students not prepared for MH 161 must take MH 160 without credit.

**Students may substitute HY 101-102-103 for HY 204-205-206.

TOTAL — 207 QUARTER HOURS

GROUP REQUISITES

A minimum total of 20 hours of requisite credit must be taken in the social sciences area and in the humanities and fine arts area with at least one course in each of the two areas. Students planning graduate study in science are encouraged to complete one year of study in French, German, or Russian as part of the Group Requisite.

Curriculum in Applied Physics (APS)

This curriculum provides a foundation in physics and emphasizes several related technical fields to provide a broader base for persons who desire to enter industrial and governmental laboratories. Individuals wishing to pursue graduate work will find that this curriculum also provides adequate preparation for advanced study.

During the junior and senior years, 20 hours of specialized courses are designated as Group Requisite I. These are to be chosen from one of the following areas: chemistry; geology; aerospace, chemical, electrical, or mechanical engineering; mathematics; or computer, environmental or nuclear science.

Students anticipating graduate work should complete French, German, or Russian through the first year sequence as a part of Group Requisite II. (See page 103.)

To those who are motivated as doers, who desire full understanding of how the physical world works, this curriculum will provide a challenge and a stimulus.

FRESHMAN YEAR

First Quarter

CH 111	General Chemistry	5
MH 161	An. Geom. & Cal.	5
EH 101	English Composition	3
HY 204	Technology & Civil**	3
	ROTC or Elective	1
	Elective	1

Second Quarter

CH 112	General Chemistry	5
MH 162	An. Geom. & Cal.	5
EH 102	English Composition	3
HY 205	Technology & Civil**	3
	ROTC or Elective	1
	Elective	1

Third Quarter

CH 113	General Chemistry	5
MH 163	An. Geom. & Cal.	5
PS 220	General Physics I	4
HY 206	Technology & Civil**	3
	ROTC or Elective	1
	Elective	1

SOPHOMORE YEAR

MH 264	An. Geom. & Cal.	5
PS 221	General Physics II	4
ME 205	Appl. Mech. Stat.	4
EH 103	English Composition	3
TS 113	Tool Lab	1
	ROTC or Elective	1

PS 222	General Physics III	4
MH 265	Lin. Diff. Equations	3
IE 204	Computer Prog.	3
TS 102	Engineering Drawing	2
	Group Requisite I	5
	ROTC or Elective	1

PS 302	Electronics	5
PS 305	Intr. Modern Physics	4
MH 266	Topics Lin. Algebra	3
	Group Requisite I	5
	ROTC or Elective	1

JUNIOR YEAR

PS 521	Modern Electronics	5
PS 300	Elec. & Magnetism I	4
MH 501	Cal. Vector Functions	5
	Group Requisite II	5

PS 501	Mechanics I	5
PS 301	Elec. & Magnetism II	4
PS 306	Physics Lab	2
	Group Requisite II	5

PS 502	Mechanics II	5
PS 303	Optics	4
MH 506	Partial Diff. Equations	3
	Group Requisite I	5

SENIOR YEAR

PS 515	Modern Physics I	5
PS 506	Exp. Physics I	2
	Group Requisite II	5
	Elective	3

PS 516	Modern Physics II	5
PS 504	Stat. Thermodynamics	5
	Group Requisite I	5

PS 507	Exp. Physics II	2
PS 520	Nuclear & Elem. Part	5
	Group Requisite II	5
	Elective	6

*Students not prepared for MH 161 must take MH 160 without credit.

**Students may substitute HY 101-102-103 for HY 204-205-206.

***Students selecting fields other than engineering for their specialization area (via Group Requisite I) may take an additional course in that area as a substitution for ME 205.

TOTAL — 207 QUARTER HOURS

GROUP REQUISITE I

Courses to be used to satisfy this requirement are to be selected by the student after consultation with and a recommendation by the department(s) in which the courses are to be taken and upon the approval of his adviser.

GROUP REQUISITE II

A minimum total of 20 hours of requisite credit must be taken in the social sciences area and in the humanities and fine arts area with at least one course in each of the two areas. Students planning graduate study should include a foreign language in Group Requisite II as mentioned above; in such case they must also take a social science course for at least five hours credit.

Curriculum in Public Administration (PUB)

This curriculum is designed to prepare students for careers in the administration of governmental units. The Political Science Department is a member of the National Association of Schools of Public Affairs and Administration. An option in Pre-City Management is designed to prepare students for graduate work in City Management. This program may be worked out with the *Public Administration Adviser*.

FRESHMAN YEAR

First Quarter

PA 202	Ethics and Society	5
	Group Req. I	4-5
EH 101	English Comp.	3
HY 101	World History	3
	ROTC or Elective	1

Second Quarter

PO 209	American Govt.	5
	Group Req. I	4-5
EH 102	English Comp.	3
HY 102	World History	3
	ROTC or Elective	1

Third Quarter

PO 210	Am. State & Loc. Govt	5
	Group Req. I	4-5
EH 103	English Comp.	3
HY 103	World History	3
	ROTC or Elective	1

SOPHOMORE YEAR

SY 201	Intr. Sociology	5
ACF 211	Prin. of Accounting	4
	Group Req. II	3-5
EH	Literature*	3
	ROTC or Elective	1

EC 200	Economics I	5
ACF 212	Prin. of Accounting	4
	Group Req. II	3-5
EH	Literature*	3
	ROTC or Elective	1

EC 202	Economics II	5
SY 202	Social Problems	5
	Group Req. II	3-5
EH	Literature*	3
	ROTC or Elective	1

*EH 253-254-255 or EH 260-261-262 or EH 250-251.

JUNIOR AND SENIOR YEARS

The student will complete the following: PO 300, 323, 325, 326, 327, 328, 329, 333, 501, 502, 514, 515, 518, 519, PG 211, SC 211; and at least 13 hours from the following: EH 315, MN 346, PO 260, 450-451.

TOTAL—201 QUARTER HOURS

GROUP REQUISITES

GROUP REQUISITE I. A minimum of 10 hours in one science, including corresponding laboratories, from the following: BI 101-102, 101-103, 101-104, BI 101-BY 201, CH 101-102-104, 103-104, GL 101-102, 110-103, PS 205-206, 220-221-222, PHS 100-101.

GROUP REQUISITE II. The student will choose any three courses from the following: Mathematics, HY 201, 202, PA 210, GY 302, JM 315, SC 202, FL through the first two quarters of the first year sequence as a minimum (See page 86).

Curriculum in Public Relations (PRJ or PRS)

FRESHMAN YEAR

First Quarter		Second Quarter		Third Quarter	
FL	Foreign Language*.....5	FL	Foreign Language*.....5	FL	Foreign Language*.....5
	Group Req. I.....3-5		Group Req. I.....3-5		Group Req. I.....3-5
EH 101	English Comp.....3	EH 102	English Comp.....3	EH 103	English Comp.....3
HY 101	World History.....3	HY 102	World History.....3	HY 103	World History.....3
	ROTC or Elective.....1		ROTC or Elective.....1	JM 101	Newspaper Style.....3
					ROTC or Elective.....1

SOPHOMORE YEAR

PO 209	American Govt.....5	PO 210	State & Loc. Govt.....5	SY 201	Intr. Sociology.....5
	Major Course.....3-5		Major Course.....3-5		Major Course.....3-5
	Group Req. II.....5		Group Req. II.....5		Intr. Pub. Rel. **.....3
EH	Literature***.....3	EH	Literature***.....3	EH	Literature***.....3
	ROTC or Elective.....1		ROTC or Elective.....1		ROTC or Elective.....1

*A foreign language through the first year sequence as a minimum.

**EH 253-254-255 or EH 260-261-262 or EH 250-251.

***Either JM 204 or SC 204 may be taken depending upon the student's major.

JUNIOR AND SENIOR YEARS

The student in the Public Relations Curriculum will select a major in Journalism (PRJ) with a minor in Speech Communication or a major in Speech Communication (PRS) with a minor in Journalism and elective work to total 201 hours.

TOTAL—201 QUARTER HOURS

GROUP REQUISITES

GROUP REQUISITE I. The student should take a minimum of ten hours in mathematics, or ten hours in philosophy, or ten hours in mathematics and philosophy, choosing the mathematics course or courses from MH 100, 140 or 160, 155, 161, 162, 163, and choosing the philosophy course or courses from PA 202, 210, 211, 212, 214, 216. Any mathematics or philosophy courses which are requisites to the student's major program will apply in fulfillment of the Group Requisite as well. Group Requisite I may be completed in either two or three quarters, depending upon the combination of courses chosen.

GROUP REQUISITE II. A minimum of 10 hours in one science, including corresponding laboratories, from the following: BI 101-102, 101-103, 101-104; BI 101-BY 201; CH 101-102-104 or 103-104 or 111-112-113, GL 101-102, 110-103; PS 205-206, 220-221-222, PHS 100-101.

MINOR

The minor in Speech Communication will consist of three of the following:

SC 301	Speech Comm. Theories.....5	SC 336	Tel. Production-Direction I.....5
SC 211	Public Speaking.....5	SC 338	Broadcast News Writing.....5

The minor in Journalism will consist of three of the following:

JM 221	Beginning News Writing.....5	JM 321	Newspaper Makeup and Layout.....5
JM 224	Copyreading or Editing.....3	JM 322	Feature Writing.....5
JM 313	Reporting.....5		

The student will take at least 20 hours from the following courses:

MT 241	Business Law.....5	PG 431	Social Psychology.....5
MT 331	Prin. of Marketing.....4	PO 341	Pressure Groups.....3
MT 332	Market Comm. Mgt.....5	PO 342	Politics & the Media.....5
MT 341	Consumer Analysis.....5	EHA 304	Technical Writing.....3
SY 204	Social Behavior.....5	EHA 315	B & P Report Writing.....3
SY 507	Pub. Opinion and Propaganda.....5	EH 390	Advanced Composition.....5
PG 211	Psychology.....5	EHA 415	Written Business Comm.....3
EC 200	Economics I.....5	EHA 416	App. Writ. & Editing.....3
EC 202	Economics II.....5		

Curriculum in Spanish and Social Work (FSW)

This curriculum allows the student to combine preparation for professional practice of Social Work with the development of a Spanish-speaking facility and knowledge of the cultural background of Spanish-speaking people. Given the substantial concentrations of Spanish-speaking people in many urban areas of southern, western, and eastern United States and the relative lack of Spanish-speaking professionally trained social workers, the curriculum enhances the probability of employment in every area of social services, family and child services, mental health services, employment training and placement services, correctional services, and services for the aged.

Students will be placed in a field internship of 15 hours in a social service agency serving Spanish-speaking clients. Students enrolled in the curriculum will receive academic and professional guidance from the Department of Foreign Languages and the Social Work Program, Department of Sociology and Anthropology.

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
FL	131	1st Year Spanish I.....5	FL	132	1st Year Spanish II.....5	FL	133	1st Year Spanish III.....5
		Group Req. I.....3-5			Group Req. I.....3-5			Group Req. I.....3-5
EH	101	English Composition.....3	EH	102	English Composition.....3	EH	103	English Composition.....3
HY	101	World History.....3	HY	102	World History.....3	HY	103	World History.....3

SOPHOMORE YEAR

FL	231	2nd Year Spanish I.....5	FL	232	2nd Year Spanish II.....5	FL	233	2nd Year Spanish III.....5
PG	212	Psychology.....5	SY	201	Intr. Sociology.....5			Elective*.....5
BI	101	Prin. of Biology.....5	BI	104	Biol. of Human Aff.....5	EC	206	Socio-Economic Frnds. 3
EH	260	Literature.....3	EH	261	Literature.....3	EH	262	Literature.....3

GROUP REQUISITE I, MATHEMATICS-PHILOSOPHY. The student should take a minimum of ten hours in mathematics, or ten hours in philosophy, or ten hours in mathematics and philosophy, choosing the mathematics course or courses from MH 100, 140 or 160 NOT BOTH, 155, 161, 162, 163, and choosing the philosophy course or courses from PA 202, 210, 211, 212, 214, 216. Any mathematics or philosophy courses which are requisites to the student's major program will apply in fulfillment of this Group Requisite as well. Group Requisite I may be completed in either two or three quarters, depending upon the combination of courses chosen.

JUNIOR AND SENIOR YEARS

During the junior year the student will complete the following:

SW	252	Social Work Colloquium.....2	SY	220	Statistics.....5
SW	375	Intr. Social Welfare.....5	SY	370	Methods of Social Res.....5
SW	376	Community Social Services.....3	PO	209	American Govt.....5
SY	304	Minority Groups.....5	PO	210	State & Loc. Govt.....5
		or	GY	304	Latin America.....5
SY	520	Rac. & Ethnic Relations.....5	PG	330	Exp. Psych. IV, Social.....5

During the senior year the student will complete the following:

SW	380	Foundations of Social Work	5	FIFTEEN HOURS CHOSEN FROM THE FOLLOWING:			
SW	506	Social Work Methods I	5	ANT	401	Kinship, Marriage & Fam.	5
SW	507	Social Work Methods II	3	ANT	511	Language and Culture	5
SW	508	Social Work Methods III	3	FL	333	Spanish Civilization	3-5
SW	575	Social Work Policy	5	FL	336	Survey Span. Am. Lit.	3-5
SW	520	Social Work Field Place	1-15	HY	300	Intr. Latin-Am. History	5
		Elective*	3-5	HY	554	History of Mexico	5
		Elective*	3-5	HY	552	History Caribbean Area	5
		Elective*	3-5	PO	539	Govt. & Pols. Latin America	5
		Elective*	3-5	PO	318	Latin America & United Sts.	5

*Electives to total 200 quarter hours.

TOTAL—200 QUARTER HOURS

Office of Public Service and Research

K. J. WARD, *Director*

R. S. MONTJOY, *Assistant Director*

E. SMITH, *Research Coordinator and Editor*

J. L. CANNON, *Training Coordinator*

The Office of Public Service and Research (OPSR) complements the instructional and research programs of Auburn's School of Arts and Sciences with the capability to respond positively to public sector needs. Organized to provide coordination and leadership, OPSR helps faculty and departments to develop, conduct and administer general extension activities and public policy research. This research is in the areas of county and municipal government finance, energy conservation, evaluation and productivity. Training activities in budgeting, communication, administration, and management include programs for county government officials, housing authority personnel, municipal revenue personnel, hospital administrators, parks and recreation officials, various professional associations, and local, state, and federal agencies. Through practical and efficient research, training and evaluation services, OPSR connects the University and the public sector by contributing to the base of knowledge necessary for informed public policy decision-making.



School of Business

GEORGE R. HORTON, JR., *Dean*

H. ELLSWORTH STEELE, *Associate Dean*

The SCHOOL OF BUSINESS prepares students to become effective and socially responsible managers of business and industrial organizations and government agencies and responsible citizens and leaders of society.

To achieve this goal, the School offers undergraduate programs leading to the Bachelor of Science in Business Administration. In addition, it offers graduate work for the degrees of Master of Business Administration (MBA), Master of Science (MS) in both Economics and Business, and the Master of Arts in College Teaching (MACT). These programs have been accredited by the American Assembly of Collegiate Schools of Business. More detailed information on the graduate programs may be found in the *Graduate School Bulletin*.

Curriculum

The undergraduate curriculum includes a two-year Pre-Business Program required of all students and a two-year Professional Option Program. These programs provide a balanced course of study for all students, with approximately one-half of the hours in business and economics courses and one-half in courses offered outside the School. The courses required have been selected so that all students will have access to the "common body of knowledge" as designated by the American Assembly of Collegiate Schools of Business.

The Pre-Business Program, a plan followed by all business students in their freshmen and sophomore years, provides a sound foundation of work in the arts and sciences, including courses in mathematics, humanities, social sciences, and natural sciences. This lower division program also includes some of the introductory business courses.

The Professional Option Programs are offered through the Departments of Accounting and Finance; Economics; Management; and Marketing and Transportation. The Professional Option plans allow each student to concentrate in an area of interest during the junior and senior years. The nine options available include: Accounting (AC), Finance (FI), Economics (EC), Organization Management (OMN), General Business-Theatre (GBT), Industrial Management (INM), Personnel Management and Industrial Relations (PIR), Marketing (MK) and Transportation (TN). Through these programs, the School seeks to develop in its students the analytical, decision-making and communication skills required of managers who lead modern organizations.

Admissions

Students who meet Auburn University's admission requirements as stated on page 15 may enter the Pre-Business Program directly from high school. Students also may transfer into the program from another school on campus or from another college or university if they have attained an overall grade point average of at least a C and have completed MH 161 Analytical Geometry and Calculus or the equivalent with a satisfactory grade.

Student Advising System

The Office of Student Affairs of the School of Business is responsible for orienting all new students, freshmen and transferees to the School. All students report each quarter to Student Affairs, Thach 215, to plan their academic schedules and to obtain information.

Faculty members are available to all students for academic counseling and career guidance. Students are encouraged to seek advice on professional and academic questions from department heads and faculty through personal arrangements or appointments made by Student Affairs.

Cooperative Education Program

Business students are eligible to participate in the University's Cooperative Education Program (see page 46). This program allows students to combine academic training with actual business experience.

Dual Degree Program Between the Schools of Business and Engineering

The Dual Degree Program in Business and Engineering at Auburn University is designed to give students the opportunity to prepare a curriculum plan which will result in a Bachelor of Science in Business Administration and a bachelor's degree in an Engineering curriculum.

Students may enter the Dual Degree Program by enrolling either in the School of Business or in the School of Engineering and by declaring an intention to study for this dual objective. An academic adviser is assigned in each School and advising is completed in both areas prior to registration each quarter. At the end of approximately five years of study, students are awarded degrees simultaneously by both Schools.

Pre-Business Program

The requirements of the Pre-Business Program are given in the model below. Students who enter from high school register in this program until they complete all Pre-Business requirements. Students who enter by transfer and who have not yet completed all Pre-Business requirements, must register in the Pre-Business Program.

Before being admitted into a Professional Option Program, business students must complete all courses in the Pre-Business Program with a satisfactory academic record.

Pre-Business Program

FRESHMAN YEAR

First Quarter		Second Quarter		Third Quarter	
MH 140	College Algebra.....5	MH 161	An. Geom. & Cal.....5	MH 151	Finite Math.....5
	Science**.....5		Science**.....5	PG 211	Psychology.....5
EH 101	English Comp.....3	EH 102	English Comp.....3	EH 103	English Comp.....3
	HY/AT/EH***.....3		HY/AT/EH***.....3		HY/AT/EH***.....3
	ROTC or Elective.....1		ROTC or Elective.....1		ROTC or Elective.....1

SOPHOMORE YEAR

First Quarter		Second Quarter		Third Quarter	
EC 200	Economics I.....5	EC 202	Economics II.....5	SC 211	Public Speaking.....5
ACF 211	Intr. Acct. I.....4	MN 274	Statistics I.....5	MT 255	Legal & Soc. Environ...4
MN 207	Intr. Computer Prog...3	ACF 212	Intr. Acct. II.....4	EHA 315	B & P Report Writing...3
	Elective†.....3		Elective††.....3		Elective†††.....4
	ROTC or elective.....1		ROTC or elective.....1		ROTC or elective.....1

*Students may take MH 160 instead. Credit is not allowed for both MH 140 and MH 160.

**Ten hours of Science are required to be selected from any of the following courses: BI 101 and 102 or 103 or 104 or BY 201; CH 101-102-104 or CH 103-104; GL 101-102-103 or 110-103; PHS 100-101; PS 205-206.

***Students may take any combination of World History, HY 101-102-103, Technology and Civilization, HY 204-205-206, History of Art, AT 171-172-173, and Western World Literature, EH 260-261-262.

†Electives may be from any area, subject to departmental requirements. During the four years of study a minimum of 40 per-cent of all hours required for graduation must be taken in Business and Economics and a minimum of 40 per-cent in non-business subjects.

††Students who have not taken typewriting in high school are strongly encouraged to take VED 200. For the Office Administration curriculum, now located in the School of Education, see page 137. Accounting students are encouraged to take PA 211 as an elective.

†††Students selecting the Accounting option take ACF 213 instead of an elective course. Students in the Organization Management and Personnel and Industrial Relations options take SY 201.

Department of Accounting and Finance

Accounting (AC)

A sound knowledge of the fundamentals of accounting is essential to success in any economic endeavor. Accounting is the language of business, and accounting procedures and records are the basic ingredients for sound management decision-making in both business and non-business organizations, including public and philanthropic bodies. Financial reports are required by the Securities and Exchange Commission with the sale of stocks and bonds which form the capital structure of our economic society. They are the basis for determining income taxes due federal and state governments.

The Professional Option Program in Accounting provides broad training in business and financial management. The student is required to take nine accounting courses above the sophomore principles courses, and may elect other courses to provide an emphasis in a particular field of managerial or public accounting. Students should take ACF 213 for four of their elective hours in Pre-Business.

FRESHMAN AND SOPHOMORE YEAR

(See Pre-Business Program)

JUNIOR YEAR

First Quarter		Second Quarter		Third Quarter	
ACF 311	Intr. Acct. I.....5	ACF 312	Intr. Acct. II.....5	ACF 313	Intr. Acct. III.....5
MT 331	Prin. of Mkt.....5	MN 346	Org. Behavior.....4	ACF 314	Income Tax.....5
ACF 361	Prin. of Finance.....5	MN 380	Prin. Op. Mgt.....4	ACF 319	Bus. Law for Acct.....5
MN 310	Prin. of Mgt.....4		Elective**.....3		

SENIOR YEAR

ACF 410	Cost Acctg.....5	MN 480	Bus. Policies.....5	ACF 416	Auditing.....5
ACF 415	Acct. Systems.....5		Acct. Elective.....5	ACF 499	Current Topics.....1
EHA 415	Written Bus. Comm...3		Humanities Elective* 3-5		Acct. Elective.....5
	Elective**.....5		Elective**.....5-3		Elective.....5

TOTAL—204 QUARTER HOURS

*To be chosen from Anthropology, Economics, Foreign Language, History, Literature, Philosophy, Political Science, Psychology, or Sociology courses.

**Accounting majors are encouraged to take MN 307, 308, and ACF 363 as elective courses.

Finance (FI)

The influence and the responsibilities of financial executives have been expanding dramatically in recent years. Financial officers are involved in the most profound decisions affecting the strategy of business operations. They decide to expand, merge, contract, and change. They are concerned not only with the pricing of products, but with the initial decision to produce them. All aspects of business affairs ultimately reduce to dollar terms, and the financial officers' intimate knowledge of the intricacies of financial operations place them in a vital role in corporate management.

The Professional Option Program in Finance offers students an opportunity to specialize in personal and institutional finance. Courses in real estate and insurance are available.

FRESHMAN AND SOPHOMORE YEARS

(See Pre-Business Program)

JUNIOR YEAR								
First Quarter			Second Quarter			Third Quarter		
ACF 361	Prin. of Finance.....	5	ACF 363	Adv. Bus. Fin.....	5	ACF 320	Risk & Ins.....	5
ACF 213	Mgt. Cost & Bdgt.....	4	MT 331	Prin. of Mkt.....	5	ACF 367	Money Mkts. &	
MN 310	Prin. of Mgt.....	4	MN 346	Org. Behavior.....	4		Fin. Inst.....	5
	Elective.....	5	MN 380	Prin. Op. Mgt.....	4	MN 382	Mgt. Info. Systems	4
							Elective.....	3
SENIOR YEAR								
ACF 464	Investments.....	5	ACF 466	Security Analysis.....	5	MN 480	Bus. Policies.....	5
EHA 415	Written Bus. Comm.....	3		Dept. Elective.....	5		Dept. Elective.....	5
	Fin. Elective.....	5		Humanities Elective*.....	3-5		Elective.....	5
	Elective.....	3		Elective.....	5-3			

TOTAL—204 QUARTER HOURS

Electives should be chosen in consultation with the adviser. See catalog course descriptions.

*To be chosen from Anthropology, Economics, Foreign Language, History, Literature, Philosophy, Political Science, Psychology, or Sociology courses.

Department Of Economics

Business Economics (EC)

Businessmen, public officials, and educators must understand the economic environment in which they live and function if they are to make sound management decisions. The Business Economics Professional Option provides the student with a sound foundation for an administrative or managerial position. The Business Economics curriculum gives the student maximum flexibility in preparing for job opportunities. The foundation provided by the common body of knowledge courses in economics, the other social sciences and business along with selected electives will equip the Business Economics student to work in marketing, management, accounting, or statistics, and in addition, provides excellent preparation for graduate or professional studies. (See also Economics Major in the School of Arts and Sciences.)

FRESHMAN AND SOPHOMORE YEARS

(See Pre-Business Program)

JUNIOR YEAR									
First Quarter			Second Quarter			Third Quarter			
ACF 361	Prin. of Finance.....	5	EC 556	Inter. Macro-		MT 331	Prin. of Mkt.....		5
EC 551	Inter. Micro-			economics.....	5		Humanities Elective*.....		5
	economics.....	5	MN 346	Org. Behavior.....	4		Dept. Elective.....		5
MN 310	Prin. Mgt.....	4		Humanities Elective*.....	5-3		Elective.....		3
	Humanities Elective*.....	3-5		Elective.....	3				

SENIOR YEAR

Second Quarter

EC 554	Hist. Ec. Thought	5
MN 382	Mgt. Info. Sys.	4
	Dept. Elective	5

Third Quarter

MN 480	Bus. Policies	5
	Dept. Elective	5
	Elective	5

First Quarter		
EHA 415	Written Bus. Comm.	3
MN 380	Prin. Oper. Mgt.	4
	Dept. Elective	5
	Dept. Elective	5

TOTAL—200 QUARTER HOURS

Economics departmental electives are any EC designated courses except EC 206.

*To be selected from Anthropology, Foreign Language, History, Literature, Philosophy, Political Science, Psychology, or Sociology courses.

Department of Management

The success or failure of any business is dependent upon the quality of its management. Business managers must acquire and effectively utilize physical, financial, and human resources to ensure an organization's survival and development. In order to make sound decisions, the manager must be knowledgeable in basic business functions as well as the process of management.

The professional options within the management department are designed to impart knowledge which will assist future managers to be good decision makers for their organizations.

General Business-Theatre (GBT)

The General Business Theatre Professional Option is an interdepartmental program between the Management Department and the Department of Theatre which is administered by the School of Business. It permits students who wish to work in professional theatre to be well grounded in business management and thus able to utilize business skills while developing their theatrical careers.

FRESHMAN YEAR

Second Quarter

MH 161	Anal. Geo. & Cal.	5
	Science	5
EH 102	English Comp.	3
TH 101	Intr. to Theatre	3
TH 300	Theatre Lab.	1
TH 100	Theatre Convo.	0

Third Quarter

MH 151	Finite Math.	5
EH 103	English Comp.	3
TH 211	Acting: Fund.	4
TH 261	Costume Constr.	4
TH 300	Theatre Lab.	1
TH 100	Theatre Convo.	0

First Quarter		
MH 140	College Algebra	5
	Science	5
EH 101	English Comp.	3
TH 231	Theatre Tech. I	4
TH 300	Theatre Lab.	1
TH 100	Theatre Convo.	0

SOPHOMORE YEAR

EC 202	Economics II	5
MN 274	Bus. & Ec. Statistics	5
ACF 211	Prin. of Acct. I.	4
TH 265	Stage Makeup	3
TH 300	Theatre Lab.	1
TH 100	Theatre Convo.	0

SC 220	Fund. Oral Interp.	
	of Lit.	5
ACF 212	Prin. of Acct. II.	4
EHA 315	Report Writing	3
TH 271	Play Analysis	4
TH 300	Theatre Lab.	1
TH 100	Theatre Convo.	0

EC 200	Economics I	5
MN 207	Intr. Computer Prog.	3
PG 212	Psychology	5
TH 240	Theatrical Design	4
TH 300	Theatre Lab.	1
TH 100	Theatre Convo.	0

JUNIOR YEAR

MN 346	Org. Behavior	4
MN 380	Prin. Op. Mgt.	4
TH 300	Theatre Lab.	1
TH 372	Hist. of Theatre II.	4
TH 405	Theat. Op./Mgt.	4
TH 100	Theatre Convo.	0

ACF 361	Prin. of Finance	5
MT 255	Leg. & Soc. Env.	4
TH 373	Hist. of Theatre III.	4
TH 300	Theatre Lab.	1
	Theatre Elective	3
TH 100	Theatre Convo.	0

MT 331	Prin. of Mkt.	5
ACF 213	Mgt. Cost & Budg.	4
MN 310	Prin. of Mgt.	4
TH 300	Theatre Lab.	1
TH 371	Hist. of Theatre I.	4
TH 100	Theatre Convo.	0

First Quarter			SENIOR YEAR			Third Quarter		
			Second Quarter					
MN 442	Personnel Mgt.	4	EHA 415	Writ Bus. Comm.	3	MN 480	Bus. Policies	5
MN 382	Mgt. Info. Systems	4	TH 300	Theatre Lab	1	TH 300	Theatre Lab	1
TH 321	Directing: Fund	4	TH 100	Theatre Convo	0	TH 100	Theatre Convo	0
TH 300	Theatre Lab	1		Business Elective*	5		Theatre Elective	4
TH 100	Theatre Convo	0		Business Elective*	5		Elective	4
	Theatre Elective	1		Theatre Elective	4			
	Business Elective*	3						

TOTAL—206 QUARTER HOURS

*Business electives must be selected from the 300, 400 or specified 500-level course offerings of the School of Business.

Industrial Management (INM)

The Industrial Management Professional Option prepares students for a broad range of managerial and staff positions in business. The functional, behavioral, economic and legal aspects of various types of business organizations are studied, utilizing a variety of analytical and conceptual models, tools, and techniques. Electives may be utilized to provide an emphasis in the area of business data processing, materials management, or operations management. Details concerning these emphases are available in the management department or student affairs office in the School of Business.

FRESHMAN AND SOPHOMORE YEARS

(See Pre-Business Program)

JUNIOR YEAR

First Quarter			Second Quarter			Third Quarter		
MT 331	Prin. of Mkt.	5	ACF 361	Prin. of Fin.	5	MN 381	Mgt. D.M.	5
ACF 213	Mgt. Cost & Bdg.	4	MN 346	Org. Behavior	4	MN 385	Prod. Mgt.	5
MN 310	Prin. of Mgt.	4	MN 380	Prin. Op. Mgt.	4		Human Elective*	5
TS 100	Intr. Mfg. Proc.	2	TS or	TE Elective	1	TS or	TE Elective*	1
	Humanities Elective*	3		Humanities Elective*	3			

SENIOR YEAR

MN 500	Labor Relations	5	EHA 415	Written Bus. Comm.	3	MN 480	Bus. Policies	5
MN 382	Mgt. Info. System	4	MN 387	Mtts. Mgt. II	3	MN 484	Oper. Mgt.	5
MN 386	Mtts. Mgt. I	3		Dept. Elective***	4		Dept. Elective***	5
	Dept. Elective***	5		Dept. Elective***	3		Humanities Elective*	3
				Elective	5			

TOTAL—206 QUARTER HOURS

*Humanities Electives must be selected from Anthropology, Economics, Foreign Language, History, Literature, Philosophy, Political Science, Psychology, or Sociology courses.

**To be selected from TS 102, 111, 112, 113, 114, 115 or TE 101.

***Departmental Electives must be selected from an approved list in the School of Business Student Affairs Office.

Organization Management (OMN)

The Organization Management Professional Option focuses on management of the functional areas inherent in profit and nonprofit organizations. It directs attention to overall business operations without emphasizing a specific type of industry, business, or service organization. Students completing this option should be well prepared to work in a variety of firms.

FRESHMAN AND SOPHOMORE YEARS

(See Pre-Business Program)

JUNIOR YEAR

First Quarter			Second Quarter			Third Quarter		
MT 331	Prin. of Mkt.	5	EC 360	Money & Banking	5	ACF 361	Prin. of Finance	5
ACF 213	Mgt. Cost & Bdg.	4	MN 346	Org. Behavior	4	MN 381	Mgt. Dec. Mak.	5
MN 310	Prin. of Mgt.	4	MN 380	Prin. of Oper. Mgt.	4	MT 241	Business Law I	4
	Hum. Elective*	5		Hum. Elective*	5		Hum. Elective*	3

SENIOR YEAR

First Quarter			Second Quarter			Third Quarter		
MT 434	Purchasing.....	5	ACF 363	Adv. Bus. Fin.	5	MN 480	Bus. Policies	5
MN 382	Mgt. Info. Sys.....	4	EHA 415	Written Bus. Comm....	3	MT 473	Phy. Dist. Mgt.....	5
MN 442	Personnel Mgt.....	4	MN 440	Organiz. Theory.....	5		Business Elective**	5
	Elective.....	4		Elective.....	3		Elective.....	3

TOTAL—206 QUARTER HOURS

*Humanities Electives must be selected from Anthropology, Economics, Foreign Language, History, Literature, Philosophy, Political Science, Psychology, or Sociology.

**Business electives must be selected from the 300 or higher level course offerings of the School of Business.

Personnel Management and Industrial Relations (PIR)

The Personnel Management and Industrial Relations Program prepares students for managing personnel and industrial relations activities. It blends a variety of subject matter into decision-making patterns that may be used to work with individual employees and unions. In addition, the program provides some free electives. Students should take SY 201 for five of their elective hours in Pre-Business.

FRESHMAN AND SOPHOMORE YEAR

(See Pre-Business Program)

JUNIOR YEAR

First Quarter			Second Quarter			Third Quarter		
MT 331	Prin. of Mkt.....	5	ACF 361	Prin. of Finance.....	5	MN 500	Labor Relat.....	5
EC 350	Labor Economics.....	5	MN 442	Personnel Mgt.....	4	MN 382	Mgt. Info. Sys.....	4
MN 310	Prin. of Mgt.....	4	MN 346	Org. Behavior.....	4	MN 541	Pers. Organ. Res. I.....	4
	Humanities Electives**	5	MN 380	Prin. Op. Mgt.....	4		Elective.....	5

SENIOR YEAR

MN 501	Labor Rel. Law.....	5	MN 447	Employee Comp.....	3	MN 480	Bus. Policies	5
MN 545	Pers. Organ. Res. II.....	3	MN 502	Labor-Mgt. Negot.....	3	MN 503	Labor Arbitrat.....	3
MN 546	Pers. Adm. Leg.....	3	MN 551	Manpower Plan.....	3	MN 550	Pers. Selec. & Pl.....	3
	Humanities Elective**	5	EHA 415	Written Bus. Comm....	3		Dept. Elective**	3
				Dept. Elective**	5		Dept. Elective**	3

TOTAL—206 QUARTER HOURS

*Humanities Electives must be selected from Anthropology, Economics, Foreign Language, History, Literature, Philosophy, Political Science, Psychology, or Sociology courses.

**Departmental Electives must be selected from the 300, 400 or specified 500-level course offerings of the Department of Management.

Department of Marketing and Transportation

Marketing and Transportation are critical in the effective operation of business in the free world. Students gain the foundation to understand the entire corporate philosophy which affects every phase of the business programs—from initial product conception to the delivery of satisfaction to the final customer. Marketing majors discover the interrelationship of marketing to other management tools and prepare themselves for such careers as sales, advertising, marketing research, product planning, and merchandising. Transportation majors complete a course of study which prepares them for careers in carrier, physical distribution, and industrial traffic management and for assignments in regulating agency administration, in urban transportation and development planning, and as traffic and transportation specialists.

Marketing (MK)

FRESHMAN AND SOPHOMORE YEARS

(See Pre-Business Program)

JUNIOR YEAR

Second Quarter

First Quarter			Third Quarter		
ACF 361	Prin. of Finance.....5	MT 336	Quan. Anal. Mkt.....5	MT 436	Mkt. Research.....5
MT 331	Prin. of Marketing.....5	MT 341	Consumer Behavior.....5	MN 346	Org. Behavior.....4
SY 201	Sociology.....5	MN 380	Prin. of Oper. Mgt.....4	MN 382	Mgt. Info.....4
MN 310	Prin. of Mgt.....4		Elective.....5		Dept. Elective†.....5

SENIOR YEAR

EHA 415	Written Bus. Comm.....3	MN 480	Business Policies.....5	MT 498	Marketing Strategy.....5
	Dept. Elective†.....5		Dept. Elective†.....5		Elective.....5
	Elective.....5-3		Directed Elective‡.....5		Elective.....5
	Humanities Electives*3-5		Elective.....2		

TOTAL—206 QUARTER HOURS

Transportation (TN)

FRESHMAN AND SOPHOMORE YEARS

(See Pre-Business Program)

JUNIOR YEAR

Second Quarter

First Quarter			Third Quarter		
ACF 361	Prin. of Finance.....5	MT 331	Prin. of Mkt.....5	MT 475	Transp. Reg. Ind.....5
MT 372	Eco. of Transp.....5	MT 473	Phys. Dist. Mgt.....5	MN 346	Org. Behavior.....4
PO 209	American Government.....5	MN 380	Prin. Oper. Mgt.....4	MN 382	Mgt. Info. Sys.....4
MN 310	Prin. of Mgt.....4		Elective.....5		Dept. Elective†.....5

SENIOR YEAR

EHA 415	Written Bus. Comm.....3	MT 476	Transp. Ent. Mgt.....5	MN 480	Business Policies.....5
	Dept. Elective†.....5		Directed Electives‡.....5		Directed Elective‡.....5
	Elective.....5-3		Elective.....5		Elective.....5
	Humanities Electives*3-5		Elective.....2		

TOTAL—206 QUARTER HOURS

†Departmental Electives may be chosen from the following lists according to student career goals:

Marketing: MT 337, 372, 432, 433, 434, 437, 438, 440, 473, 581, 582, 583, 483, ACF 213.

Transportation: MT 336, 337, 341, 434, 437, 438, 440, 474, 477, 484, ACF 213.

‡Directed Electives may be chosen from business or non-business courses according to career goals upon approval of departmental advisers.

*To be chosen from Anthropology, Economics, Foreign Language, History, Literature, Philosophy, Political Science, Psychology, or Sociology courses.

School of Education

JACK E. BLACKBURN, *Dean*
J. BOYD SCEBRA, *Associate Dean*
VIRGINIA HAYES, *Assistant Dean*
NANCY LOPOSER, *Assistant to the Dean*
TRUMAN M. PIERCE, *Dean Emeritus*

THE SCHOOL OF EDUCATION is accredited by the National Council for Accreditation of Teacher Education for the preparation of teachers and school service personnel with the doctor's degree as the highest degree approved.

Emphasis in all programs is upon the preparation of personnel who will be able to meet successfully the performance demands of the roles they assume in their professional positions. An effort is made through processes of Continuous Program Renewal to revise constantly programs based upon systematic evaluative-feedback data secured on the performance of graduates on the job.

Undergraduate Curricula

Teaching and non-teaching programs are offered through the School of Education. Teaching programs are presented first, followed by non-teaching programs.

The following requirements apply to students pursuing a teacher education curriculum. A total of 210 quarter hours is required to complete the program which leads to the degree of Bachelor of Science in Education.

Scholastic Requirements

The Selective Admission and Retention Program in Teacher Education—In recognition of responsibilities to the schools in which its graduates teach, the School maintains a program of selective admission and retention of candidates for the teaching profession. This program is designed to assure that no candidate is recommended for admission to the Teacher Education Program, the professional internship or certification unless he is deemed competent in his University studies and professional performance.

The student must submit a formal written application for admission to Teacher Education after completing at least 90 quarter hours (60 semester hours) of work, usually at the end of the sophomore year. Transfer students must submit the application after completing at least 12 quarter hours (nine semester hours) at Auburn University. Criteria for admission are*:

- (1) a minimum grade point average of at least 2.2 (on a four point scale) on all college work attempted during the previous 90 quarter hours;
- (2) satisfactory performance on a written and spoken English language competency examination;
- (3) satisfactory performance in an interview examining personality, interests, and aptitudes consistent with the requirements for successful teaching;
- (4) a score of at least 16 on the ACT test, which cannot be more than five years old; and

(5) successful performance in the pre-professional field experience.

A student who fails to meet these criteria upon initial application may submit new evidence in an effort to satisfy any and/or all of the above standards.

Any exception to these criteria must be approved by the Dean of the School of Education.

While retention in the Teacher Education Program is based on the continuous evaluation of the student, a formal evaluation takes place as a prerequisite for admission to the professional internship. Requirements for admission to the professional internship are*:

- (1) admission to the Teacher Education Program;
- (2) completion of appropriate courses in the area of specialization;
- (3) a grade point average of 2.2 or above on all courses attempted in each of the following: professional teacher education, the teaching major, and the teaching minor; and
- (4) demonstrated potential for teaching.

In addition, in order to be eligible for graduation with teacher certification, the student will be expected to complete the requirements identified above, to demonstrate readiness to teach through on-the-job performance, and to achieve a satisfactory score on a comprehensive examination.

Persons with degrees other than in education may make application for study in a curriculum leading to professional certification, but they will be required to complete the above standards in order to qualify for certification.

Applications and specific information about the criteria of selection for admission to teacher education are available from the Teacher Education Services in Haley Center 3403.

*Required of entering students as of June 1, 1977.

Program Options, Teaching

The following Table shows program options available in the School of Education. Some programs are composite, or single major programs; some programs require two teaching majors. An x indicates where programs are available and whether one or two majors are required.

Undergraduate Programs in Education

	Grade Levels					2nd Major Required	
	N-3	4-6	7-9	10-12	N-12	Yes	No
Early Childhood	X						X
Elementary Education		X					X
French			X	X		X	
German			X	X		X	
Spanish			X	X		X	
Language Arts (composite)			X	X			X
English			X	X		X	
Journalism				X			X
Mathematics (composite)			X	X			X
Mathematics			X	X		X	

	Grade Levels				2nd Major Required	
	N-3	4-6	7-8	10-12	N-12	Yes No
General Science (composite)			X	X		X
Biology				X		X
Chemistry				X		X
Physics				X		X
Social Science (composite)			X	X		X
Economics				X		X
Geography				X		X
History			X	X		X
Political Science				X		X
Psychology				X		X
Sociology				X		X
Agribusiness				X		X
Business & Office				X		X
Distributive Ed.				X		X
Health Occupations				X		X
Home Economics			X	X		X
Trade & Industrial				X		X
Art					X	X
Health Education		X-N-6-X			X	X
Physical Education		X-N-6-X			X	X
Physical Education			X	X		X
Industrial Arts					X	X
Music, Instrumental					X	X
Vocal/Choral					X	X
General		X	N-9-X			X
Speech/Theatre					X	X
ECE-Handicapped		X				X
Emotionally Conflicted					X	X
Mentally Retarded					X	X
Speech Pathology					X	X

Requirements for Fields of Specialization

Requirements are listed below for the teaching fields. Curriculum check lists are available in the Office of Teacher Education Services, 3403 Haley Center.

Courses in the first section are required in all Teacher Education Programs in the School of Education.

REQUIRED IN ALL PROGRAMS IN EDUCATION

Humanistic and Behavioral Studies: 20 Hrs. IED 101 Career Exploration or — 102 Orientation (1); FED 300 Educational Psychology (5); CED 322 Human Relations Training in Teacher Education (2); FED 350 Cultural Foundations of Education (5); EDL 401 Organization and Support of Public Education (2); RSE 561 Exceptional Child in the Classroom (5).

Evaluation of Teaching and Learning: 5 Hrs. FED 400 Management and Evaluation in Education (5).

Internship: 15 Hrs. — 425 Internship (15).

Additional Requirements in Each Program in Education

EARLY CHILDHOOD, N-3

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved Literature Elective* (3); MU 371 Introduction to Music (3); Approved Humanities* or Fine Arts Electives (5).

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 101, 102, 103 World History or HY 204, 205, 206, Technology and Civilization (9); Approved Social Science Electives* (6).

Natural and Physical Science and Mathematics: 20 Hrs. BI 101 Principles of Biology (5); MH 281, 282 Elementary Mathematics (10); PHS 101 or 102 Physical Science (5).

Electives from Above: 10 Hrs. Approved Electives* from above areas (10).

Health and Physical Ed.: 4 Hrs. PE Elective (1-3); Health Education Elective (1-3).

Electives: 16 Hrs. Approved Electives* (16).

Curriculum and Teaching and Media: 22 Hrs. EM 200 Educational Media (2); EED 320 Early Childhood Curriculum I (10); EED 420 Early Childhood Curriculum II (10).

Reading: 10 Hrs. EED 370, 371 Fundamentals of Reading Instruction I and II (10).

Area of Specialization: 41 Hrs. HPR 211 Sensorimotor Activities (3); HPR 394 Elementary School Health (3); AT 301 Elementary School Art (5); EM 510 Media for Children (4); SC 550 Principles of Speech Correction (5); EED 304 Music and Related Arts (5); TH 308 Creative Dramatics (3); FCD 270 Structure and Function of Family (4); EED 440 Human Resources in the Educative Process or FCD 467 Parent Education (4); FCD 301 Human Development III (5).

*See Departmental Advisor for Approval of Electives prior to enrolling.

ELEMENTARY 4-6

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved Literature Elective* (3); MU 371 Introduction to Music (3); SC 202 or SC 301 or SC 211 or SC 326 or SC 273 (3-5); Approved Humanities or Fine Arts Electives* (0-2).

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 101, 102, 103 World History or HY 204, 205, 206 Technology & Civilization (9); Approved Social Science Electives* (6).

Natural and Physical Science and Mathematics: 20 Hrs. BI 101 Principles of Biology (5); PHS 100 or PHS 101 Physical Science (5); MH 281, 282 Elementary Mathematics (10).

Electives from Above: 10 Hrs. Approved Electives* from above areas (10).

Health and Physical Ed.: 4 Hrs. PE Elective (1-3); Health Education Elective (1-3).

Electives: 16 Hrs. Approved Electives* (16).

Curriculum and Teaching and Media: 22 Hrs. EM 200 Educational Media (2); EED 302 Curriculum I, Language (5); EED 303 Curriculum I, Social Science (5); EED 402 Curriculum II, Mathematics (5); EED 403 Curriculum II, Natural Science (5).

Reading: 10 Hrs. EED 370, 371 Fundamentals of Reading Instruction I and II (10).

Area of Specialization: 40 Hrs. HPR 394 Elementary School Health (3); HPR 212 Elementary School Activities (3); AT 301 Elementary School Art (5); EM 510 Media for Children (4); SC 550 Principles of Speech Correction (5); EED 304 Music and Related Arts (5); Approved Electives* (15).

*See Departmental Adviser for Approval of Electives prior to enrolling.

FRENCH, 7-9

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved Literature Elective* (3); Fine Arts Elective from AT, MU and/or TH (3); Humanities Elective from AT, EH, FL, MU, PA, RL, SC, or TH (5).

Social Sciences: 20 Hrs. EC 200 Economics (5); Approved Social Science Electives* (6); HY 101 or 204, 102 or 205, 103 or 206 World History or Technology and Civilization (9).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Elective from BI, BY, ZY, VM (5); Physical Science Elective from PHS, PS, CH, GL, AM, AY (5); Mathematics Elective from MH (5); Mathematics or Science Elective from above (5).

Electives from Above: 10 Hrs. FL Elective (5); Elective from Social Science, Natural Science, Physical Science or Mathematics (see 2nd major) (5).

Health and Physical Ed.: 4 Hrs. PE Elective (1-3); Health Education Elective (1-3).

Electives: 16 Hrs. Free; may be from 2nd major (16).

Curriculum and Teaching and Media: 19 Hrs. EM 200 Educational Media (2); SED 419 The Middle School (5); SED 405 Teaching in Area of Specialization (3); SED 410 Program in Area of Specialization (3); Teaching and Program in 2nd major (6).

Reading: 10 Hrs. EED 370 Fundamentals of Reading Instruction I (5); SED 570 Reading in the Content Area (5).

Area of Specialization: 48 Hrs. FL 121, 122, 123 First Year French (15); FL 221, 222, 223 Second Year French (15); FL 321 Conversation & Phonetics (3); FL 322 Composition (3); FL 323 Civilization (3); FL 324 and/or 325 and/or 326 Survey of French Literature (6); FL Elective, 300 Level or above (3).

*See Departmental Adviser for Approval of Electives prior to enrolling.

FRENCH, 10-12

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved Literature Elective* (3); Fine Arts Elective from AT, MU or TH (1-3); Humanities Elective in FL or 2nd major (5-7).

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 101 or 204, 102 or 205, 103 or 206 World History or Technology & Civilization (9); Social Science Elective from ANT, AT 171, 172, 173 Art History, EC, GY, HY, PO, PG, SY (6).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Elective from BI, BY, ZY, VM (5); Physical Science Elective from PHS, PS, CH, GL, AM, AY (5); Mathematics Elective, MH (5); Mathematics or Science Elective from above (5).

Electives from Above: 10 Hrs. FL from Area of Specialization (5); Social Science or Mathematics or Science Elective from above — selected from 2nd major when possible (5).

Health and Physical Ed.: 4 Hrs. PE Elective (1-3); Health Education Elective (1-3).

Electives: 16 Hrs. Electives (16). May be from Area of Specialization or 2nd Major.

Curriculum and Teaching and Media: 19 Hrs. EM 200 Educational Media (2); SED 420 The Secondary School (5); SED 405 Teaching in Area of Specialization (3); SED 410 Program in Area of Specialization (3); Teaching & Program in 2nd Major (6).

Reading: 5 Hrs. SED 570 Reading in Content Area (5).

Area of Specialization: 48 Hrs. FL 121, 122, 123 First Year French (15); FL 221, 222, 223 Second Year French (15); FL 321 Conversation & Phonetics (3); FL 322 Composition (3); FL 323 Civilization (3); FL 324 and/or 325 and/or 326 Survey of French Literature (6); Approved Electives* in French (3).

*See Departmental Adviser for Approval of Electives prior to enrolling.

GERMAN, 10-12

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved Literature Elective* (3); Fine Arts Elective from AT, MU or TH (1-3); Humanities Elective in FL or 2nd major (5-7).

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 101 or 204, 102 or 205, 103 or 206 World History or Technology & Civilization (9); Social Science Elective from ANT, AT 171, 172, 173 Art History; EC, GY, HY, PO, PG, SY (6).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Elective from BI, BY, ZY, VM (5); Physical Science Elective from PHS, PS, CH, GL, AM, AY (5); Mathematics Elective, MH (5); Mathematics or Science Elective from above (5).

Electives from Above: 10 Hrs. FL from Area of Specialization (5); Social Science or Mathematics or Science Elective from above — selected from 2nd major when possible (5).

Health and Physical Ed.: 4 Hrs. PE Elective (1-3); Health Education Elective (1-3).

Electives: 16 Hrs. Electives (16); May be from Area of Specialization or 2nd Major.

Curriculum and Teaching and Media: 19 Hrs. EM 200 Educational Media (2); SED 420 The Secondary School (5); SED 405 Teaching in Area of Specialization (3); SED 410 Program in Area of Specialization (3); Teaching & Program in 2nd Major (6).

Reading: 5 Hrs. SED 570 Reading in Content Area (5).

Area of Specialization: 48 Hrs. FL 151, 152, 153 First Year German (15); FL 251, 252, 253 Second Year German (15); FL 351 Conversation & Phonetics (3); FL 352 Composition (3); FL 353 Civilization (3); FL 354 and/or 355 and/or 356 Survey of German Literature (6); Approved Electives* in German.

*See Departmental Adviser for Approval of Electives prior to enrolling.

SPANISH, 7-9

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved Literature Elective* (3); Fine Arts Elective from AT, MU and/or TH (3); Humanities Elective from AT, EH, FL, MU, PA, RL, SC or TH (5).

Social Sciences: 20 Hrs. EC 200 Economics (5); Approved Social Science Electives* (6); HY 101 or 204, 102 or 205, 103 or 206 World History or Technology and Civilization (9).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Elective from BI, BY, ZY, VM (5); Physical Science Elective from PHS, PS, CH, GL, AM, AY (5); Mathematics Elective from MH (5); Mathematics or Science Elective from above (5).

Electives from Above: 10 Hrs. FL Elective (5); Elective from Social Science, Natural Science, Physical Science or Mathematics (see 2nd major) (5).

Health and Physical Ed.: 4 Hrs. PE Elective (1-3); Health Education Elective (1-3).

Electives: 16 Hrs. Free; may be from 2nd major (16).

Curriculum and Teaching and Media: 19 Hrs. EM 200 Educational Media (2); SED 419 The Middle School (5); SED 405 Teaching in Area of Specialization (3); SED 410 Program in Area of Specialization (3); Teaching and Program in 2nd major (6).

Reading: 10 Hrs. EED 370 Fundamentals of Reading Instruction I (5); SED 570 Reading in the Content Area (5).

Area of Specialization: 48 Hrs. FL 131, 132, 133 First Year Spanish (15); FL 231, 232, 233 Second Year Spanish (15); FL 331 Conversation & Phonetics (3); FL 332 Composition (3); FL 333 or 338 Spanish Civilization or Spanish American Civilization (3); FL 334 and/or FL 335 and/or FL 336 Survey of Spanish Literature (6); FL Elective, 300 Level or Above (3).

*See Departmental Adviser for Approval of Electives prior to enrolling.

SPANISH, 10-12

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved Literature Elective* (3); Fine Arts Elective from AT, MU or TH (1-3); Humanities Elective in FL or 2nd major (5-7).

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 101 or 204, 102 or 205, 103 or 206 World History or Technology and Civilization (9); Social Science Elective from ANT, AT 171, 172, 173 Art History; EC, GY, HY, PO, PG, SY (6).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Elective from BI, BY, ZY, VM (5); Physical Science Elective from PHS, PS, CH, GL, AM, AY (5); Mathematics Elective, MH (5); Mathematics or Science Elective from above (5).

Electives from Above: 10 Hrs. FL from Area of Specialization (5); Social Science or Mathematics or Science Elective from above — selected from 2nd major when possible (5).

Health and Physical Ed.: 4 Hrs. PE Elective (1-3); Health Education Elective (1-3).

Electives: 16 Hrs. Electives (16); May be from Area of Specialization or 2nd major.

Curriculum and Teaching and Media: 19 Hrs. EM 200 Educational Media (2); SED 420 The Secondary School (5); SED 405 Teaching in Area of Specialization (3); SED 410 Program in Area of Specialization (3); Teaching and Program in 2nd major (6).

Reading: 5 Hrs. SED 570 Reading in Content Area (5).

Area of Specialization: 48 Hrs. FL 131, 132, 133 First Year Spanish (15); FL 231, 232, 233 Second Year Spanish (15); FL 331 Conversation & Phonetics (3); FL 332 Composition (3); FL 333 or 338 Spanish Civilization or Spanish/American Civilization (3); FL 334 and/or 335 and/or 336 Survey of Spanish Literature (6); Approved Electives* in Spanish (3).

*See Departmental Adviser for Approval of Electives prior to enrolling.

LANGUAGE ARTS, 7-9 (Composite)

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved Literature* (3); Approved Humanities Elective* from TH, EH, AT, MU, SC, RL, PA, FL (5).

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 101, 102, 103 or 204, 205, 206 World History or Technology & Civilization (9); Approved Social Science Electives* from GY, HY, PO, SY, EC, PG, ANT (6).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Elective from BI, BY, ZY, VM (5); Physical Science Elective from PHS, PS, CH, GL, AM, AY (5); Mathematics Elective from MH (5); Mathematics or Science Elective from above (5).

Electives from Above: 10 Hrs. Humanities Elective from above (5); Social Science or Science or Mathematics Elective (5).

Health and Physical Ed.: 4 Hrs. PE Elective (1-3); Health Education Elective (1-3).

Electives: 16 Hrs. Electives (16).

Curriculum and Teaching and Media: 16 Hrs. EM 200 Educational Media (2); SED 419 The Middle School (5); SED 411, 412, 413 Teaching English (9).

Reading: 10 Hrs. EED 370 Fundamentals of Reading Instruction I (5); SED 570 Reading in the Content Area (5).

Area of Specialization: 60 Hrs. SED 501 Language Study for Teachers (5); SED 502 Rhetoric & Composition for Teachers (5); SED 576 Reading of Adolescents (5); EH 390 Advanced Composition (5); EH 357 or 358 American Literature (5); EH 253 or 254 or 255 English Literature (3); Electives in EH (13); Electives in SC (8); Electives in TH (8). **

*See Departmental Adviser for Approval of Electives prior to enrolling.

**Electives do not include Freshman composition.

LANGUAGE ARTS, 10-12 (Composite)

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved Literature Elective* (3); Fine Arts Elective in TH (3); Humanities Elective from EH, TH, AT, FL, MU, PA, RL, or SC (5).

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 101 or 204, 102 or 205, 103 or 206 World History or Technology & Civilization (9); Social Science Elective from ANT, EC, GY, HY, PG, PO, SY (6);

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Elective from BI, BY, ZY, VM (5); Physical Science Elective from PHS, PS, CH, GL, AM, AY (5); Mathematics Elective MH (5); Mathematics or Science Elective from above (5).

Electives from Above: 10 Hrs. Humanities Elective from above (5); Social Science or Science or Mathematics Elective from above (5).

Health and Physical Ed.: 4 Hrs. PE Elective (1-3); Health Education Elective (1-3).

Electives: 16 Hrs. Free Electives (16).

Curriculum and Teaching and Media: 16 Hrs. EM 200 Educational Media (2); SED 411, 412, 413 Teaching English (9); SED 420 The Secondary School (5).

Reading: 5 Hrs. SED 570 Reading in the Content Area (5).

Area of Specialization: 80 Hrs. EH 357 or 358 American Literature (5); EH 551 or 552 Shakespeare (5); EH 390 Advanced Composition (5); SED 501 Language study for Teachers (5); SED 502 Rhetoric & Composition for Teachers (5); SED 576 Reading of Adolescents (5); EH 393 Introduction to study of English Language, or EH 541 History of the English Language, or EH 594 Introduction to Linguistics (5); Approved Electives in EH* to include EH 260 or 261 or 262 (20); Approved Electives TH* (8); Approved Electives SC*, including SED 201 P (8); Approved Electives in JM* (4); Electives from EH, SC, TH or Reading (5). **

*See Departmental Adviser for Approval of Electives prior to enrolling.

**Electives do not include Freshman composition.

ENGLISH, 7-9

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved Literature (3); Fine Arts Elective from AT, MU or TH (1-3); Humanities Elective from AT, EH, MU, TH, SC, FL, RL, PA (0-2); EH from Area of Specialization (5).

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 101 or 204, 102 or 205, 103 or 206 World History or Technology & Civilization (9); Approved Social Science Electives* from SY, PO, GY, EC, HY, PG, ANT (6).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Elective from BI, BY, ZY, VM (5); Physical Science Elective from PHS, PS, CH, GL, AM, AY (5); Mathematics Elective from MH (5); Mathematics or Science Elective from above (5).

Electives from Above: 10 Hrs. EH Elective from Area of Specialization (3-5); Social Science, Natural or Physical Science or Mathematics Elective, see 2nd major (5-7).

Health and Physical Ed.: 4 Hrs. PE Elective (1-3); Health Education Elective (1-3).

Electives: 16 Hrs. Select from Area of Specialization or 2nd major (16).

Curriculum and Teaching and Media: 22 Hrs. EM 200 Educational Media (2); SED 419 The Middle School (5); SED 411, 412, 413 Teaching English (9); Programs and Teaching in 2nd major (6).

Reading: 10 Hrs. EED 370 Fundamentals of Reading Instruction I (5); SED 570 Reading in the Content Area (5).

Area of Specialization: 40 Hrs. SED 501 Language Study for Teachers (5); SED 502 Rhetoric & Composition for Teachers (5); SED 576 Reading of Adolescents (5); EH 390 Advanced Composition (5); EH 357 or 358 American Literature (5); EH 253 or 254 or 255 English Literature (3); EH 260 or 261 or 262 World Literature (3); Approved EH Electives* (9).

*See Departmental Adviser for Approval of Electives prior to enrolling.

ENGLISH, 10-12

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved Literature Elective* (3); Fine Arts Elective from AT, MU, or TH (1-3); EH Course from Area of Specialization (5); Humanities Electives from AT, EH, FL, MU, PA, RL, SC, or TH (0-2).

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 101 or 204, 102 or 205, 103 or 206 World History or Technology & Civilization or HY 201 or 202 U.S. History (9); Social Science Electives from ANT, EC, GY, HY, PG, PO, SY (6).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Elective from BI, BY, ZY, VM (5); Physical Science Elective from PHS, PS, CH, GL, AM, AY (5); Mathematics Elective MH (5); Mathematics or Science Elective from above (5).

Electives from Above: 10 Hrs. EH Course from Area of Specialization (5); Elective from Social Science or Mathematics or Science Above — Select from 2nd major when possible (5).

Health and Physical Ed.: 4 Hrs. PE Elective (1-3); Health Education Elective (1-3).

Electives: 16 Hrs. Elective, to be selected from Area of Specialization or 2nd major (16).

Curriculum and Teaching and Media: 16 Hrs. EM 200 Educational Media (2); SED 411, 412, 413 Teaching English (9); SED 420 The Secondary School (5).

Reading: 5 Hrs. SED 570 Reading in Content Area (5).

Area of Specialization: 40 Hrs. EH 250, 251 English Literature for Superior Students or EH 253, 254, 255 English Literature or EH 260, 261, 262 World Literature (9-10); EH 551 or 552 Shakespeare (5); EH 357 or 358 American Literature (5); SED 501 Language Study for Teachers (5); SED 502 Rhetoric & Composition for Teachers (5); Approved EH Electives (10-11).*

*See Departmental Adviser for Approval of Electives prior to enrolling.

**Electives do not include Freshman composition.

JOURNALISM, 10-12

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved Literature Elective* (3); Fine Arts Elective from AT, MU, TH (1-3); Humanities Elective from AT, EH, FL, MU, PA, RL, SC, TH (5-7)

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 101 or 204; 102 or 205, 103 or 206 World History or Technology & Civilization (9); Social Science Elective from ANT, EC, GY, HY, PG, PO, SY Select from 2nd major if possible (6).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Elective from BI, BY, ZY, VM (5); Physical Science Elective from PHS, PS, CH, GL, AM, AY (5); Mathematics Elective from MH (5); Mathematics or Science Elective from above (5).

Electives from Above: 10 Hrs. Humanities Elective from major 1 or 2, if possible (5); Social Science or Mathematics or Science Elective — from 2nd major if possible (5).

Health and Physical Ed.: 4 Hrs. PE Elective (1-3); Health Education Elective (1-3).

Electives: 16 Hrs. Electives (16). May be selected from Area of Specialization or 2nd major.

Curriculum and Teaching and Media: 19 Hrs. EM 200 Educational Media (2); SED 405 Teaching in Area of Specialization (3); SED 410 Program in Area of Specialization (3); Teaching & Program in 2nd major (6); SED 420 The Secondary School (5).

Reading: 5 Hrs. SED 570 Reading in Content Area (5).

Area of Specialization: 43 Hrs. EH 390 Advanced Composition (5); JM 101 Newspaper Style (3); JM 221 Newswriting (5); JM 313 Reporting (5); JM 314 Copyreading & Editing (5); JM 465 History & Principles of Journalism (5); SC 338 Broadcast Newswriting (5); SED 495 Practicum (5); JM 421 Photo-Journalism (5)

*See Departmental Adviser for Approval of Electives prior to enrolling.

MATHEMATICS, 7-9 (Composite)**

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved Literature Elective* (3); Fine Arts Electives Selected from AT, MU, TH (3); Humanities Electives selected from AT, EH, FL, MU, PA, RL, SC, TH (5).

Social Sciences: 20 Hrs. EC 200 Economics (5); Social Science Electives from ANT, AT 171, 172, 173 Art History; EC, GY, HY, PG, PO, SY (15).

Natural and Physical Science and Mathematics: 20 Hrs. BI 101 Principles of Biology (5); CH 101 or 102 or 103 Chemistry or GL 101 Introductory Geology or PS 205 Introductory Physics or PHS 100 Introductory Physical Science (5); MH 161, 162 Analytical Geometry & Calculus (10).

Electives from Above: 10 Hrs. Electives from two of three above categories; Humanities, Social Science, Science and Mathematics (10).

Health and Physical Ed.: 4 Hrs. PE 101 Foundations of Physical Education (1); PE Vigorous (1); PE Recreational (1); Health Education Elective (1).

Electives: 16 Hrs. Free Electives (16).

Curriculum and Teaching and Media: 20 Hrs. EM 200 Educational Media (2); SED 401 Teaching Mathematics in the Middle School (4); SED 402, 403 Mathematics Program & Teaching I, II (6); SED 404 Teaching Mathematics Applications (3); SED 420 The Secondary School.

Reading: 10 Hrs. EED 370 Fundamentals of Reading Instruction I (5); SED 570 Reading in the Content Area (5).

Area of Specialization: 64 Hrs. MH 161, 162, 163 Analytic Geometry/Calculus (15); MH 173 Calculus Laboratory (1); MH 264 Analytic Geometry/Calculus (5); MH 265 Linear Differential Equations or MH 301 History of Mathematics (3); MH 266 Linear Algebra (3); MH 331 Modern Algebra (5); MH 541 Geometry: A Modern View (3); MH 587 Mathematical Statistics (5); Approved MH Electives* (10-14); Electives in one related area from CH, EC, PS, PG, MH (applied) TS Computer Science (10-14). (Credit not allowed for MH 100, 140, 151, 281, 282, 283.)

*See Departmental Adviser for Approval of Electives prior to enrolling.

**Program must include one of the following 3 course sequences: AT 171, 172, 173 Art History; HY 101, 102, 103 World History; AY 204, 205, 206 Technology and Civilization EH 260, 261, 262 (9).

MATHEMATICS, 7-9

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved Literature Elective* (3); Fine Arts Elective from AT, MY, TH (1-3); Humanities Electives from AT, EH, FL, MU, PA, RL, SC, TH (5-7).

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 101 or 204, 102 or 205, 103 or 206 World History or Technology & Civilization (9); Approved Social Science Electives* from ANT, AT 171, 172, 173, EC, GY, HY, PO, PG, SY (6).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science selected from BI, BY, ZY, VM (5); Physical Science selected from PHS, CH, PS, GL, AM, AY (5); MH 161, 162 Analytic Geometry and Calculus (10).

Electives from Above: 10 Hrs. Mathematics course from Area of Specialization (5); Humanities or Social Science Elective, See 2nd major (5).

Health and Physical Ed.: 4 Hrs. PE Elective (1-3); Health Education Elective (1-3).

Electives: 16 Hrs. May select from Area of Specialization or 2nd major (16).

Curriculum and Teaching and Media: 20 Hrs. EM 200 Educational Media (2); SED 419 The Middle School (5); SED 401 Teaching Mathematics in the Middle School (4); SED 402 or 403 Programs & Teaching (3); Teaching & Programs in 2nd major (6).

Reading: 10 Hrs. EED 370 Fundamentals of Reading Instruction I (5); SED 570 Reading in Content Area (5).

Area of Specialization: 40 Hrs. MH 161, 162, 163 Analytic Geometry/Calculus (15); MH 173 Calculus Laboratory (1); MH 264 Analytic Geometry/Calculus (5); MH 265 Linear Differential Equations or MH 301 History of Mathematics (3); MH 266 Linear Algebra (3); MH 331 Modern Algebra (5); MH 541 Geometry: A Modern View (3); MH 567 Mathematical Statistics (5).

*See Departmental Adviser for Approval of Electives prior to enrolling.

MATHEMATICS, 10-12 (Composite)**

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or 105, 106 Honors English (9); Approved Literature Elective* (3); Fine Arts Electives selected from AT, MU, TH (3); Humanities Electives Selected from AT, EH, FL, MU, PA, RL, SC, TH (5).

Social Sciences: 20 Hrs. EC 200 Economics (5); Social Science Electives from ANT, AT 171, 172, 173 Art History; EC, GY, HY, PG, PO, SY (15).

Natural and Physical Science and Mathematics: 20 Hrs. BI 101 Principles of Biology (5); CH 101, or 102 or 103 Chemistry or GL 101 Introductory Geology or PS 205 Introductory Physics or PHS 100 Introductory Physical Science (5); MH 161, 162 Analytic Geometry & Calculus (10).

Electives from Above: 10 Hrs. Electives from two of three above categories; Humanities, Social Science, Science and Mathematics (10).

Health and Physical Ed.: 4 Hrs. PE 101 Foundations of Physical Education (1); PE Vigorous (1); PE Recreational (1); Health Education Elective (1).

Electives: 16 Hrs. Free Electives (16).

Curriculum and Teaching and Media: 16 Hrs. EM 200 Educational Media (2); SED 402, 403 Mathematics Program & Teaching I, II (6); SED 404 Teaching Mathematics: Application & Techniques (3); SED 420 The Secondary School (5).

Reading: 5 Hrs. SED 570 Reading in Content Area.

Area of Specialization: 72 Hrs. MH 161, 162, 163 Analytic Geometry/Calculus (15); MH 173 Calculus Laboratory (1); MH 264 Analytic Geometry/Calculus (5); MH 265 Linear Differential Equations (3); MH 266 Linear Algebra (3); MH 301 History of Mathematics (3); MH 331 Modern Algebra (5); MH 332 Modern Algebra or MH 505 Matrix Theory or MH 515 Algebra for Applied Math or MH 537 Linear Algebra (5); MH 541 Geometry: A Modern View (3); MH 542 Geometry: A Modern View or MH 543 Linear Geometry or MH 544 Combinatorial Geometry (4); MH 567 Mathematical Statistics (5). In addition students will select option 1, 2, 3 or 4: Option 1: General Mathematics/Applied Mathematics — Approved Mathematics Electives* (2); Option 2: General Mathematics/Applications and Models — Approved Mathematics Electives* (8-12); Approved Electives* from EC, CH, PS, PG, TS (10-14). Option 3: Mathematics/Computer Science — MH 560 Introduction to Numerical Analysis or MH 561 Numerical Matrix Analysis (5); MH 518 Analysis for Applied Math (5); IE 204 Computer Programming or MH 271 Mathematical Programming (3); IE 301 Information Retrieval/Computer Programming (3); Approved Electives in Computer Science (6). Option 4: Advanced Program: MH 520, 521, 522 Analysis I, II, III (15); Approved 500 level Math Elective* (5).

*See Departmental Adviser for Approval of Electives prior to enrolling.

**Program must include one of the following 3-course sequences 171, 172, 173 Art History; HY 101, 102, 103 World History; HY 204, 205, 206 Technology & Civilization; EH 260, 261, 262 (9).

MATHEMATICS, 10-12

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved Literature Elective* (3); Fine Arts Electives from AT, MU or TH (1-3); Humanities Electives from AT, EH, FL, MU, PA, RL, SC or TH — select from 2nd major if possible (5-7).

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 101 or 204, 102 or 205, 103 or 206 World History or Technology & Civilization (9); Social Science Electives from ANT, AT 171, 172, 173; EC, GY, HY, PG, PO or SY (6).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Elective from BI, BY, ZY, VM (5); Physical Science Elective from PHS, PS, CH, GL, AM, AY (5); MH 161, 162 Analytic Geometry & Calculus (10).

Electives from Above: 10 Hrs. MH 163 Analytic Geometry & Calculus (5); Elective from Humanities or Social Sciences above — from 2nd major if possible (5).

Health and Physical Ed.: 4 Hrs. PE Electives (1-3); Health Education Elective (1-3).

Electives: 16 Hrs. Electives (16). Select from Area of Specialization or 2nd Major if possible.

Curriculum and Teaching and Media: 19 Hrs. EM 200 Educational Media (2); SED 402, 403 Curriculum & Teaching I, II (6); Programs & Teaching in 2nd major (6); SED 420 The Secondary School (5).

Reading: 5 Hrs. SED 570 Reading in Content Area (5).

Area of Specialization: 40 Hrs. MH 161, 162, 163 Analytic Geometry/Calculus (15); MH 173 Calculus Laboratory (1); MH 264 Analytic Geometry/Calculus (5); MH 265 Linear Differential Equations or MH 301 History of Mathematics or MH 501 Calculus of Vector Functions** (3); MH 266 Linear Algebra (3); MH 331 Modern Algebra (5); MH 541 Geometry: A Modern View (3); MH 567 Mathematical Statistics (5).

*See Departmental Adviser for Approval of Electives prior to enrolling.

**Required for Physics Major.

GENERAL SCIENCE, 7-9 (Composite)

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved Literature Elective* (3); Fine Arts Elective from AT, MU or TH (1-3); Humanities Electives selected from AT, EH, FL, MU, PA, RL, SC or TH (5-7).

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 101 or 204; 102 or 205; 103 or 206 World History or Technology & Civilization (9); Approved Social Science Electives* from ANT, AT 171, 172, 173 Art History; EC, GY, HY, PG, PO, SY (6).

Natural and Physical Science and Mathematics: 20 Hrs. BI 101 Principles of Biology (5); PS 205 Physics (5); GL 101 Geology (5); MH 160 or 161 Pre-Calculus/Trigonometry or Analytical Geometry/Calculus (5).

Electives from Above: 10 Hrs. Approved Elective* from Humanities or Social Science (5); CH 103 Chemistry (5).

Health and Physical Ed.: 4 Hrs. PE Elective (1-3); Health Education Elective (1-3).

Electives: 16 Hrs. Free; may select a science concentration.

Curriculum and Teaching and Media: 16 Hrs. EM 200 Educational Media (2); SED 419 The Middle School (5); SED 405 Teaching in Area of Specialization (3); SED 410 Program in Area of Specialization (3); SED 415 Contemporary Theories and Their Application (3).

Reading: 10 Hrs. EED 370 Fundamentals of Reading Instruction I (5); SED 570 Reading in the Content Area (5).

Area of Specialization: 65 Hrs. BI 101 Principles of Biology (5); BI 102 Plant Biology (5); BI 103 Animal Biology (5); CH 103 Chemistry I (5); CH 104 Chemistry II (5); CH 207 Organic Chemistry (5); PS 205 Physics I (5); PS 206 Physics II (5); PS 215 Astronomy (5); GL 101, 102 (10); AM 304 Meteorology (5); Approved Science Elective* from Biology, Chemistry, Physics, Earth & Space Science (5).

*See Departmental Adviser for Approval of Electives prior to enrolling.

GENERAL SCIENCE, 10-12 (Composite)

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved Literature Elective* (3); Fine Arts Elective from AT, MU or TH (1-3); Humanities Elective from AT, EH, FL, MU, PA, RL, SC, or TH — Select from 2nd major if possible (5-7).

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 101 or 204; 102 or 205; 103 or 206 World History or Technology & Civilization (9); Social Science Electives from ANT; AT 171, 172, 173 Art History; EC, GY, HY, PG, PO, SY (6).

Natural and Physical Science and Mathematics: 20 Hrs. BI 101 Principles of Biology (5); PS 205 Introductory Physics (5); MH 160 or 161 Pre-Calculus with Trigonometry or Analytical Geometry & Calculus (5); GL 101 Introductory Geology (5).

Electives from Above: 10 Hrs. CH 103 Fundamentals of Chemistry (5); Electives from Humanities or Social Science above (5).

Health and Physical Ed.: 4 Hrs. PE Elective (1-3); Health Education Elective (1-3).

Electives: 16 Hrs. Electives (16). May be used for a Science Concentration.

Curriculum and Teaching and Media: 16 Hrs. EM 200 Educational Media (2); SED 405 Teaching in Area of Specialization (3); SED 410 Program in Area of Specialization (3); SED 415 Contemporary Theories and Their Application (3); SED 420 The Secondary School (5).

Reading: 5 Hrs. SED 570 Reading in the Content Area (5).

Area of Specialization: 80 Hrs. BI 101 Principles of Biology (5); BI 102 Plant Biology (5); BI Electives, 300 Level or Above (10); CH 103, 104 Fundamentals of Chemistry I, II (10); CH Electives (10); PS 205, 206 Introductory Physics I, II (10); PS Electives (10); GL 101, 102 Introductory Geology I, II (10); Electives in Earth & Space Science 300 Level or above (10).

*See Departmental Adviser for Approval of Electives prior to enrolling.

BIOLOGICAL SCIENCE, 10-12

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved Literature Elective* (3); Fine Arts Elective from AT, MU or TH (1-3); Humanities Elective from AT, EH, FL, MU, PA, RL, SC or TH — Select from 2nd major if possible (5-7).

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 101 or 204; 102 or 205; 103 or 206 World History or Technology & Civilization (9); Social Science Electives from ANT; AT 171, 172, 173 Art History; EC, GY, HY, PG, PO, SY (6).

Natural and Physical Science and Mathematics: 20 Hrs. BI 101 Principles of Biology (5); CH 103 Fundamentals of Chemistry (5); PS 200 Foundations of Physics (5); MH 140 or 160 or 161 College Algebra or Pre-Calculus with Trigonometry or Analytical Geometry/Calculus (5).

Electives from Above: 10 Hrs. Electives from Humanities or Social Sciences above, selected from 2nd major if possible (5); Elective from Earth/Space Science, AY or AM or GL (5).

Health and Physical Ed.: 4 Hrs. PE Elective (1-3); Health Education Elective (1-3).

Electives: 16 Hrs. Electives (16). May be from Area of Specialization or 2nd major.

Curriculum and Teaching and Media: 19 Hrs. EM 200 Educational Media (2); SED 405 Teaching in Area of Specialization (3); SED 410 Program in Area of Specialization (3); Teaching & Program in 2nd major (6); SED 420 The Secondary School (5).

Reading: 5 Hrs. SED 570 Reading in the Content Area (5).

Area of Specialization: 40 Hrs. BI 101 Principles of Biology (5); BI 102 Plant Biology (5); BI 103 Animal Biology (5); ZY 250 Human Anatomy (5); ZY 251 Physiology (5); ZY 300 Genetics (5); Approved Electives* from 300 level or higher ZY, BY (10).

*See Departmental Adviser for Approval of Electives prior to enrolling.

CHEMISTRY, 10-12

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or 105, 106 Honors English (9); Approved Literature Elective* (3); Fine Arts Elective from AT, MU or TH (1-3); Humanities Elective from AT, EH, FL, MU, PA, RL, SC or TH — Select from 2nd major if possible (5-7).

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 101 or 204; 102 or 205; 103 or 206 World History or Technology & Civilization (9); Social Science Electives from ANT; AT 171, 172, 173 Art History; EC, GY, HY, PG, PO, SY (6).

Natural and Physical Science and Mathematics: 20 Hrs. BI 101 Principles of Biology (5); PS 205 Introductory Physics (5); MH 160 or 161 Pre-Calculus with Trigonometry or Analytical Geometry/Calculus (5); Elective from AY, AM or GL (5).

Electives from Above: 10 Hrs. CH 103 Fundamentals of Chemistry (5); Humanities or Social Science Elective from above — Select from 2nd major if possible (5).

Health and Physical Ed.: 4 Hrs. PE Elective (1-3); Health Education Elective (1-3).

Electives: 16 Hrs. Electives (16) May be from Area of Concentration or 2nd major.

Curriculum and Teaching and Media: 19 Hrs. EM 200 Educational Media (2); SED 405 Teaching in Area of Specialization (3); SED 410 Program in Area of Specialization (3); Teaching & Program in 2nd major (6); SED 420 The Secondary School (5).

Reading: 5 Hrs. SED 570 Reading in the Content Area (5).

Area of Specialization: 40 Hrs. CH 103, 104, 105 Fundamentals of Chemistry (15); CH 207, 208 Organic Chemistry (10); Approved Electives in CH* with 13 hours 300 level or above (15).

*See Departmental Adviser for Approval of Electives prior to enrolling.

PHYSICS, 10-12

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved Literature Elective* (3); Fine Arts Elective from AT, MU, or TH (1-3); Humanities Electives from AT, EH, FL, MU, PA, RL, SC or TH — Select from 2nd major if possible (5-7).

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 101 or 204; 102 or 205; 103 or 206 World History or Technology & Civilization (9); Social Science Electives from ANT; AT 171, 172, 173 Art History; EC, GY, HY, PG, PO, SY (6).

Natural and Physical Science and Mathematics: 20 Hrs. BI 101 Principles of Biology (5); PS 205 Introductory Physics (5); MH 160 or 161 Pre-Calculus with Trigonometry or Analytical Geometry/Calculus (5); Elective from AY, AM or GL (5).

Electives from Above: 10 Hrs. PS 205 Introductory Physics (5); Humanities or Social Science Electives from above — select from 2nd major if possible (5).

Health and Physical Ed.: 4 Hrs. PE Elective (1-3); Health Education Elective (1-3).

Electives: 16 Hrs. Electives (16) May be from Area of Specialization or 2nd major.

Curriculum and Teaching and Media: 19 Hrs. EM 200 Educational Media (2); SED 405 Teaching in Area of Specialization (3); SED 410 Program in Area of Specialization (3); Teaching & Program in 2nd major (6); SED 420 The Secondary School (5).

Reading: 5 Hrs. SED 570 Reading in the Content Area (5).

Area of Specialization: 40 Hrs. PS 205, 206 Introductory Physics I, II (10); PS 215 Astronomy (5); PS 300 Electricity & Magnetism I (4); Approved Electives in PS*, PHS to include 10 hrs. 300 level or above (21).

*See Departmental Adviser for Approval of Electives prior to enrolling.

SOCIAL SCIENCE, 7-9 (Composite)

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved Literature Elective* (3); Fine Arts Elective from AT, MU, TH (1-3); Humanities Electives (5-7).

Social Sciences: 20 Hrs. EC 200 Economics (5); Approved Social Sciences* from EC, GY, HY, PO, PG, SY in Area of Specialization (15).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Elective from BI, BY, ZY, VM (5); Physical Science Elective from PHS, PS, CH, GL, AM, AY (5); Mathematics Elective from MH (5); Mathematics or Science Elective (5).

Electives from Above: 10 Hrs. Approved Elective from Humanities* or Mathematics or Science (5); ANT or SY from Area of Specialization (5).

Health and Physical Ed.: 4 Hrs. PE Elective (1-3); Health Education Elective (1-3).

Electives: 16 Hrs. Free Electives (16)

Curriculum and Teaching and Media: 16 Hrs. EM 200 Educational Media (2); SED 419 The Middle School (5); SED 405 Teaching in Area of Specialization (3); SED 410 Program in Area of Specialization (3); SED 415 Contemporary Theories and Their Application (3).

Reading: 10 Hrs. EED 370 Fundamentals of Reading I (5); SED 570 Reading in the Content Area (5).

Area of Specialization: 69 Hrs. HY 101, 102, 103 World History (9); HY 507 U.S. History or HY 508 Modern America (5); HY Elective (3); PO 209 Introduction to American Government (5); PO 312 Introduction to Comparative Government (5); PO Elective (3); GY 214 Physical Geography (5); GY 215 Cultural Geography (5); EC 200 Economics (5); EC 206 Socio-Economic Foundations of Contemporary America (3); SY 201 Introductory Sociology or ANT 203 Introduction to Anthropology (5); Approved Social Science Electives* (16).

*See Departmental Adviser for Approval of Electives prior to enrolling.

SOCIAL SCIENCE, 10-12 (Composite)

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved Literature Elective* (3); Fine Arts Elective from AT, MU, TH (3); Humanities Elective from AT, EH, FL, MU, PA, RL, SC, TH (5).

Social Sciences: 20 Hrs. EC 200 Economics (5); Approved Social Sciences* from Area of Specialization GY, HY, PO, PG, SY (15).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Elective from BI, BY, ZY, VM (5); Physical Science Elective from PHS, PS, CH, GL, AM, AY (5); MH Elective (5); Mathematics or Science Elective from above (5).

Electives from Above: 10 Hrs. ANT 203 Introduction to Anthropology (5); Elective from Humanities or Mathematics or Science above (5).

Health and Physical Ed.: 4 Hrs. PE Elective (1-3); Health Education Elective (1-3).

Electives: 16 Hrs. Free Electives (16).

Curriculum and Teaching and Media: 16 Hrs. EM 200 Educational Media (2); SED 405 Teaching in Area of Specialization (3); SED 410 Program in Area of Specialization (3); SED 415 Contemporary Theories and their Application (3); SED 420 The Secondary School (5).

Reading: 5 Hrs. SED 570 Reading in Content Area (5).

Area of Specialization: 60 Hrs. HY 101, 102, 103 World History (9); HY 507 Recent U.S. History (5); HY 508 Modern America (5); HY 300 or HY 301 Introduction to Latin America or Introduction to Far Eastern History (5); PO 209 Introduction to American Government (5); PO 312 Introduction to comparative Government (5); PO 328 Government and the Economy or PO 329 The Presidency (3); GY 214 Physical Geography (5); GY 215 Cultural Geography (5); EC 200 Economics (5); EC 206 Socio-Economic Foundations of Contemporary America (3); PG 211 Psychology (5); SY 201 Introduction to Sociology (5); SY 202 Social Problems (5); SED 421 Social Science Methods (5); ANT 203 Introduction to Anthropology (5).

*See Departmental Adviser for Approval of Electives prior to enrolling.

ECONOMICS, 10-12

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); EH 260, 261, 262 World Literature (9); Fine Arts Electives from AT, MU, TH (2).

Social Sciences: 20 Hrs. EC 200 Economics (5); Approved Social Science Electives*, GY and PO and PG (15).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Elective from BI, BY, ZY, VM (5); Physical Science Elective from PHS, PS, CH, GL, AM, AY (5); MH Elective (5); Mathematics or Science Elective from above (5); Select from 2nd Major when possible.

Electives from Above: 10 Hrs. Elective from ANT or PA (5); Elective from Humanities or Mathematics or Science (5); Select from 2nd major when possible.

Health and Physical Ed.: 4 Hrs. PE Elective (1-3); Health Education Elective (1-3).

Electives: 16 Hrs. American or US HY Elective (5); SY Elective (5); Free Electives (6); Select from 2nd major when possible.

Curriculum and Teaching and Media: 16-22 Hrs. EM 200 Educational Media (2); SED 405 Teaching in Area of Specialization (3); SED 410 Program in Area of Specialization (3); SED 415 Contemporary Theories (3); SED 420 The Secondary School (5); Teaching & Program in 2nd major if applicable (6).

Reading: 5 Hrs. SED 570 Reading in Content Area (5).

Area of Specialization: 40 Hrs. EC 200 Economics (5); SED 421 Social Science Concepts (5); Approved EC Electives*, including 8 hrs. 300 level or higher (30).

*See Departmental Adviser for Approval of Electives prior to enrolling.

GEOGRAPHY, 10-12

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); EH 260, 261, 262 World Literature (9); Fine Arts Electives from AT, MU, TH (2).

Social Sciences: 20 Hrs. EC 200 Economics (5); Approved Social Science Electives*, SY and PO and PG (15).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Elective from BI, BY, ZY, VM (5); Physical Science Elective from PHS, PS, CH, GL, AM, AY (5); MH Elective (5); Mathematics or Science Elective from above (5); Select from 2nd Major when possible.

Electives from Above: 10 Hrs. Elective from ANT or PA (5); Elective from Humanities or Mathematics or Science (5); Select from 2nd major when possible.

Health and Physical Ed.: 4 Hrs. PE Elective (1-3); Health Education Elective (1-3).

Electives: 16 Hrs. American or US HY Elective (5); SY Elective (5); Free Electives (6); Select from 2nd major when possible.

Curriculum and Teaching and Media: 16-22 Hrs. EM 200 Educational Media (2); SED 405 Teaching in Area of Specialization (3); SED 410 Program in Area of Specialization (3); SED 415 Contemporary Theories (3); SED 420 The Secondary School (5); Teaching & Program in 2nd major if applicable (6).

Reading: 5 Hrs. SED 570 Reading in Content Area (5).

Area of Specialization: 40 Hrs. GY 214 Physical Geography (5); GY 215 Cultural Geography (5); SED 421 Social Science Concepts (5); Approved GY Electives*, including 8 hrs. 300 level or higher (25).

*See Departmental Adviser for Approval of Electives prior to enrolling.

HISTORY, 7-9

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved Literature Elective* (3); Fine Arts Elective selected from AT, MU, TH (1-3); Humanities Elective selected from AT, EH, FL, MU, PA, RL, SC, TH, select from 2nd major when possible (5-7).

Social Sciences: 20 Hrs. EC 200 Economics (5); Approved GY, PO, and PG Elective* (15).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science elective from BI, BY, ZY, VM (5); Physical Science elective from PHS, PS, CH, GL, AM, AY (5); Mathematics elective from MH (5); Mathematics or Science Elective from above (5).

Electives from Above: 10 Hrs. Elective from ANT or PA (5); Elective from Humanities or Science or Mathematics, select from 2nd major when possible (5).

Health and Physical Ed.: 4 Hrs. PE Elective (1-3); Health Education Elective (1-3).

Electives: 16 Hrs. HY 201 or 202 U.S. History (5); SY 201 Intro. to Sociology (5); Selections from Area of Specialization or 2nd major when possible (6).

Curriculum and Teaching and Media: 13-19 Hrs. EM 200 Educational Media (2); SED 419 The Middle School (5); SED 405 Teaching in Area of Specialization (3); SED 410 Program in Area of Specialization (3); Teaching and Program in 2nd Major (6).

Reading: 10 Hrs. EED 370 Fundamentals of Reading Instruction I (5); SED 570 Reading in Content Area (5).

Area of Specialization: 40 Hrs. HY 101, 102, 103 World History (9); HY 201, 202 U.S. History (10); Approved HY Electives* with 13 hours 300 level or above (21).

*See Departmental Adviser for Approval of Electives prior to enrolling.

HISTORY, 10-12

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved Literature Elective* (3); Fine Arts Electives from AT, MU, TH (1-3); Humanities Electives from AT, EH, FL, MU, PA, RL, SC, TH (5-7).

Social Sciences: 20 Hrs. EC 200 Economics (5); Approved Social Science Electives* from PO and PG and GY (15).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Elective from BI, BY, ZY, VM (5); Physical Science Elective from PHS, PS, CH, GL, AM, AY (5); MH Elective (5); Mathematics or Science Elective from above (5); Select from 2nd Major when possible.

Electives from Above: 10 Hrs. Elective from ANT or PA (5); Electives from Humanities or Mathematics or Science (5); Select from 2nd major when possible.

Health and Physical Ed.: 4 Hrs. PE Elective (1-3); Health Education Elective (1-3).

Electives: 16 Hrs. SY Elective (5); Free Electives (11); Select from 2nd major when possible.

Curriculum and Teaching and Media: 16-22 Hrs. EM 200 Educational Media (2); SED 405 Teaching in Area of Specialization (3); SED 410 Program in Area of Specialization (3); SED 415 Contemporary Theories (3); SED 420 The Secondary School (5); Teaching & Program in 2nd major, if applicable (6).

Reading: 5 Hrs. SED 570 Reading in Content Area (5).

Area of Specialization: 40 Hrs. HY 101, 102, 103 World History (9); HY 201, 202 U.S. History (10); SED 421 Social Science Concepts (5); Approved HY Electives* (16); Including 8 hrs. 300 level or above.

*See Departmental Adviser for Approval of Electives prior to enrolling.

POLITICAL SCIENCE, 10-12

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); EH 260, 261, 262 World Literature (9); Fine Arts Electives from AT, MU, TH (2).

Social Sciences: 20 Hrs. EC 200 Economics (5); Approved Social Science Electives*, PG and SY and GY (15).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Elective from BI, BY, ZY, VM (5); Physical Science Elective from PHS, PS, CH, GL, AM, AY (5); MH Elective (5); Mathematics or Science Elective from above (5); Select from 2nd major when possible.

Electives from Above: 10 Hrs. Elective from ANT or PA (5); Elective from Humanities or Mathematics or Science (5); Select from 2nd major when possible.

Health and Physical Ed.: 4 Hrs. PE Elective (1-3); Health Education Elective (1-3).

Electives: 16 Hrs. American or U.S. HY Elective (5); Free Electives (11); Select from 2nd major when possible.

Curriculum and Teaching and Media: 16-22 Hrs. EM 200 Educational Media (2); SED 405 Teaching in Area of Specialization (3); SED 410 Program in Area of Specialization (3); SED 415 Contemporary Theories (3); SED 420 The Secondary School (5); Teaching & Program in 2nd major if applicable (6).

Reading: 5 Hrs. SED 570 Reading in Content Area (5).

Area of Specialization: 40 Hrs. PO 209 American Government (5); PO 210 State and Local Government (5); PO 312 Comparative Government (5); SED 421 Social Science Concepts (5); Approved PO Electives* (20) Including 3 hrs. 300-level or higher.

*See Departmental Adviser for Approval of Electives prior to enrolling.

PSYCHOLOGY, 10-12

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); EH 260, 261, 262 World Literature (9); Fine Arts Electives from AT, MU, TH (2).

Social Sciences: 20 Hrs. EC 200 Economics (5); Approved Social Science Electives*, GY and PO and SY (15).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Elective from BI, BY, ZY, VM (5); Physical Science Elective from PHS, PS, CH, GL, AM, AY (5); MH Elective (5); Mathematics or Science Elective from above (5); Select from 2nd Major when possible.

Electives from Above: 10 Hrs. Elective from ANT or PA (5); Elective from Humanities or Mathematics or Science (5); Select from 2nd major when possible.

Health and Physical Ed.: 4 Hrs. PE Elective (1-3); Health Education Elective (1-3).

Electives: 16 Hrs. American or U.S. HY Elective (5); Free Electives (11); Select from 2nd major when possible.

Curriculum and Teaching and Media: 16-22 Hrs. EM 200 Educational Media (2); SED 405 Teaching in Area of Specialization (3); SED 410 Program in Area of Specialization (3); SED 415 Contemporary Theories (3); SED 420 The Secondary School (5); Teaching & Program in 2nd major if applicable (6).

Reading: 5 Hrs. SED 570 Reading in Content Area (5).

Area of Specialization: 40 Hrs. PG 211 General Psychology (5); PG 330 Social Psychology (4 or 5); SED 421 Social Science Concepts (5); Approved PG Electives (25-26) Including 4 hrs. 300 level or higher.

*See Departmental Adviser for Approval of Electives prior to enrolling.

SOCIOLOGY, 10-12

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); EH 260, 261, 262 World Literature (9); Fine Arts Electives from AT, MU, TH (2).

Social Sciences: 20 Hrs. EC 200 Economics (5); Approved Social Science Electives*, GY and PO and PG (15).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Elective from BI, BY, ZY, VM (5); Physical Science Elective from PHS, PS, CH, GL, AM, AY (5); MH Elective (5); Mathematics or Science Elective from above (5); Select from 2nd Major when possible.

Electives from Above: 10 Hrs. Elective from ANT or PA (5); Elective from Humanities or Mathematics or Science (5); Select from 2nd major when possible.

Health and Physical Ed.: 4 Hrs. PE Elective (1-3); Health Education Elective (1-3).

Electives: 16 Hrs. American or U.S. HY Elective (5); Free Electives (11); Select from 2nd major when possible.

Curriculum and Teaching and Media: 16-22 Hrs. EM 200 Educational Media (2); SED 405 Teaching in Area of Specialization (3); SED 410 Program in Area of Specialization (3); SED 415 Contemporary Theories (3); SED 420 The Secondary School (5); Teaching & Program in 2nd major if applicable (6).

Reading: 5 Hrs. SED 570 Reading in Content Area (5).

Area of Specialization: 40 Hrs. SY 201 Introduction to Sociology (5); SY 202 Social Problems (5); SED 421 Social Science Concepts (5); Approved SY Electives* (25); Including 8 hrs. 300 level or higher.

*See Departmental Adviser for Approval of Electives prior to enrolling.

AGRIBUSINESS, 10-12

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved SC Elective* (3); EH 260 and/or 261 and/or 262 World Literature (6); Fine Arts Electives from AT, MU, CA 116 (2); JM 316 approved as humanities elective.

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 103 or 206 World or Technology & Civilization (3); Approved Social Science Electives* from EC, GY, HY, PO, PG, or SY (12).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Elective from BI, BY, ZY, VM (5); CH Electives (10); MH Elective (5).

Electives from Above: 10 Hrs. Biology Elective from BI, BY, ZY (5); Social Science and/or Humanities Electives from above (5).

Health and Physical Ed.: 4 Hrs. PE Elective (1-3); Health Education Elective (1-3).

Electives: 16 Hrs. VED 346 or 541 Development/History Vocational Education (3-4); AEC 202 or AEC 301 Agricultural Economics/Marketing (5); ADS 200 Introduction to Animal and Dairy Science (5); Free Electives (3).

Curriculum and Teaching and Media: 10 Hrs. EM 200 Educational Media (2); VED 414 Program in Area of Specialization (3); VED 415 Teaching in Area of Specialization (5).

Reading: 5 Hrs. SED 570 Reading in Content Area (5).

Area of Specialization: 75 Hrs. Following courses or Competency Exam and 2-hr. Practicum in each required: ADS 200 Introduction to Animal & Dairy Science (5); HF 221 Landscape Gardening (5); AY 307 General Soils (5); AEC 301 Agricultural Marketing or AEC 202 Agricultural Economics I (5); AY 502 Economic Entomology (5); VED 408 General Shop (5); Poultry or Forestry Electives (5); Approved Electives* from ADS, AEC, AN, AY, FY, HF, RSY, ZY, VED to Total 75 hrs.

*See Departmental Adviser for Approval of Electives prior to enrolling.

BUSINESS EDUCATION, 10-12

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved SC Elective* (3); EH 260 and/or 261 and/or 262 World Literature (6); Fine Arts Electives from AT, MU, CA 116 (2); JM 316 approved as humanities elective.

Social Sciences: 20 Hrs. EC 200, 202 Economics (10); HY 103 or 206 World/Technology & Civilization (3); Social Science Electives from EC, GY, HY, PG, PO, or SY (7).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Electives from BI, BY, ZY (10); Physical Science Elective from PHS, PS, CH, GL, AM, or AY (5); MH Elective (5).

Electives from Above: 10 Hrs. Elective from Social Science Above (5); Elective from Humanities or Science or Mathematics above (5).

Health and Physical Ed.: 4 Hrs. PE Elective (1-3); Health Education Elective (1-3).

Electives: 16 Hrs. VED 346 or 541 Development/History of Vocational Education (3-4); ACF 340 Personal Finance (3); Free Electives (9-10).

Curriculum and Teaching and Media: 10 Hrs. EM 200 Educational Media (2); VED 414 Program in Area of Specialization (3); VED 415 Teaching in Area of Specialization (5).

Reading: 5 Hrs. SED 570 Reading in Content Area (5).

Area of Specialization: 75 Hrs. EC 200, 202 Economics I, II (10); VED 202 Typewriting III (3); VED 312 Shorthand III (5); ACF 211, 212 Accounting I, II (8); MN 207 Data Processing or VED 495 Practicum in Data Processing (2); VED 305 Records Management (3); MN 310 Principles of Management (4); ACF 340 Personal Finance (3); MT 241 Business Law I (4); VED 420 Office Machines (3); VED 422 Secretarial Procedures I (5); EH 415 Written Business Communication (3); VED 462 Directed Work Experience (5); Approved Electives* in VED, ACF, EC, MN, MT (17).

*See Departmental Adviser for Approval of Electives prior to enrolling.

DISTRIBUTIVE EDUCATION, 10-12

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved SC Elective* (3); EH 260 and/or 261 and/or 262 World Literature (6); Fine Arts Electives from AT, MU, CA 116 (2); JM 316 approved as humanities elective.)

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 103 or 206 World History or Technology & Civilization (3); Social Science Electives from EC, GY, HY, PG, PO, SY (12).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Elective from BI, BY, ZY (5); Physical Science Elective from PHS, PS, CH, GL (10); MH Elective (5).

Electives from Above: 10 Hrs. EC 202 Economics (5); Electives from Humanities or Science or Mathematics (5).

Health and Physical Ed.: 4 Hrs. PE Elective (1-3); Health Education Electives (1-3).

Electives: 16 Hrs. VED 346 or 541 Development/History of Vocational Education (3-4); Free Electives (12-13).

Curriculum and Teaching and Media: 10 Hrs. EM 200 Educational Media (2); VED 414 Program in Area of Specialization (3); VED 415 Teaching in Area of Specialization (5).

Reading: 5 Hrs. SED 570 Reading in Content Area (5).

Area of Specialization: 70 Hrs. EC 200, 202 Economics (10); MN 310 Introduction to Management (3); ACF 340 Personal Finance (3); MT 331 Principles of Marketing (5); MT 241 Business Law I or MT 242 Business Law II or MT 344 Environmental Law or MT 255 Legal & Social Environmental Business or MN 346 Organization Behavior (4); MT 337 Fundamentals of Salesmanship or MN 440 Organization Theory or MN 442 Personnel Management or CA 325 Fashion Merchandising (4-5); MT 332 Marketing Communication Management or MT 341 Consumer Analysis or MT 432 Promotional Strategy or MT 437 Sales Management (5); MT 333 Merchandising Management or MT 433 Retail Store Management or MT 440 International Marketing (5); MT 438 Marketing Channel Systems or MT 372 Economics of Transportation or MT 473 Physical Distribution Management (5); VED 510 Occupational Information (5); VED 556 Learning Resources (4); VED 558 Coordination in Vocational Programs (5); Approved Electives* (8).

*See Departmental Adviser for Approval of Electives prior to enrolling.

HEALTH OCCUPATIONS, 10-12

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved SC Elective* (3); EH 260 and/or 261 and/or 262 World Literature (6); Fine Arts Electives from AT, MU, CA 116 (2); JM 316 approved as humanities elective.)

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 103 or 206 World or Technology & Civilization (3); Social Science Electives from EC, GY, HY, PG, PO, SY (12).

Natural and Physical Science and Mathematics: 20 Hrs. CH Elective (5); Natural Science Elective from BI, BY, ZY (10); MH Elective (5).

Electives from Above: 10 Hrs. Natural Science Elective from above (5); Social Science or Humanities Elective from above (5).

Health and Physical Ed.: 4 Hrs. PE Elective (1-3); Health Education Elective (1-3).

Electives: 16 Hrs. VED 346 or 541 Development/History Vocational Education (3-4); Approved Electives* (12-13).

Curriculum and Teaching and Media: 10 Hrs. EM 200 Educational Media (2); VED 414 Program in Area of Specialization (3); VED 415 Teaching in Area of Specialization (5).

Reading: 5 Hrs. SED 570 Reading in Content Area (5).

Area of Specialization: 75 Hrs. VED 352 Nomenclature for Health-Related Occupations (5); VED 354 Careers in Health Related Occupations (5); VED 356 Health Delivery Systems (5); VED 495 Practicum (12); VED 462 Directed Work Experience (1-15); Approved * NF Elective (3); Approved Health Science Elective* (3); Approved * FCD Elective (3-4); Approved Electives* from ANT, HPR, PCS, PA, PO, PG, SY, SW, VED (24-38).

*See Departmental Adviser for Approval of Electives prior to enrolling.

HOME ECONOMICS, 7-9

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); SC 202 or 211 or 273 or 235 or 204 Speech (3); EH 260 and/or 261 and/or 262 World Literature (6); Fine Arts Elective from AT, MU or CA 116 (2).

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 103 or 206 World History or Technology & Civilization (3); Approved Social Science Electives* from GY, HY, PG, PO, SY (12).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science elective from BI, BY, ZY (10); Physical Science elective from CH (5); Mathematics elective from MH (5).

Electives from Above: 10 Hrs. Physical Science elective from CH, PS, PHS (5); Social Science or Humanities elective from above (5).

Health and Physical Ed.: 4 Hrs. PE Elective (1-3); Health Education Elective (1-3).

Electives: 16 Hrs. VED 346 Vocational and Adult Education or VED 541 Development of Vocational Education (3-4); CA 116L Art for Living Lab. (2); NF 112 Nutrition and Man (3); CA 105 Fundamentals of Clothing (5); Free Electives (2-3).

Curriculum and Teaching and Media: 15 Hrs. EM 200 Educational Media (2); VED 411 Teaching and Techniques (5); VED 413 Program Planning for Middle School (3); VED 550 Career Education (5).

Reading: 10 Hrs. EED 370 Fundamentals of Reading I (5); SED 570 Reading in Content Area (5).

Area of Specialization: 78 Hrs. CA 105 Fundamentals of Clothing (5); CA 113 Housing for Man (3); CA 115 Clothing and Man (3); CA 116L Art for Living Lab (2); CA 206 Garment Structures (5); CA 233 Home Equipment (5); CA 323 Man the Consumer (3); CA 431 Man-Environment Relations (2); CA 443 Home Management Residence (5); CA 116 Art for Every Day Living (3); CA 303 The House (5); FCD 270 Family II (4); FCD 330 Stages in the Family Life Circle (5); FCD 467 Parent Education (4); NF 104 Principles of Food Preparation (5); NF 112 Nutrition and Man (3); NF 204 Meal Management (5); NF 404 Quantity Food Preparation (5); FCD 301 Human Development III (5); VED 462 Directed Work Experience (1-15).

*See Departmental Adviser for Approval of Electives prior to enrolling.

HOME ECONOMICS, 10-12

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved SC Elective* (3); EH 260 and/or 261 and/or 262 World Literature (6); Fine Arts Electives from AT, MU, CA 116 (2). (JM 316 approved as humanities elective.)

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 103 or 206 World or Technology & Civilization (3); Social Science Electives from EC, GY, HY, PG, PO, SY (12).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science from BI, BY, ZY (10); CH Elective (5); MH Elective (5).

Electives from Above: 10 Hrs. Physical Science from PHS, PS, CH (5); Social Science or Humanities Elective from above (5).

Health and Physical Ed.: 4 Hrs. PE Elective (1-3); Health Education Elective (1-3).

Electives: 16 Hrs. VED 346 or 541 Development/History of Vocational Education (3-4); CA 116L Art for Living Lab (2); CA 105 Fundamentals of Clothing (5); NF 112 Nutrition and Man (3); Free Electives (3).

Curriculum and Teaching and Media: 10 Hrs. EM 200 Educational Media (2); VED 414 Program in Area of Specialization (3); VED 415 Teaching in Area of Specialization (5).

Reading: 5 Hrs. SED 570 Reading in Content Area (5).

Area of Specialization: 78 Hrs. CA 105 Fundamentals of Clothing (5); CA 113 Housing for Man (3); CA 115 Clothing and Man (3); CA 116L Art for Living Laboratory (2); CA 206 Garment Structures (5); CA 233 Home Equipment (5); CA 323 Man the Consumer (3); CA 431 Man-Environment Relations (2); CA 443 Home Management Residence (5); CA 116 Art for Everyday Living (3); CA 303 The House (5); FCD 270 Family II (4); FCD 330 Stages in Family Life Circle (5); FCD 467 Parent Education (4); NF 104 Principles of Food Preparation (5); NF 112 Nutrition and Man (3); NF 204 Meal Management (5); NF 404 Quantity Food Preparation (5); FCD 301 Human Development III (5); VED 462 Directed Work Experience (1-15).

*See Departmental Adviser for Approval of Electives prior to enrolling.

TRADE AND INDUSTRIAL, 10-12

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved SC Elective* (3); EH 260 and/or 261 and/or 262 World Literature (6); Fine Arts Electives from AT, MU, CA 116 (2). (JM 316 approved as humanities elective.)

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 103 or 206 World or Technology & Civilization (3); Approved Social Science Electives* from EC, GY, HY, PO, PG, or SY (12).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Electives from BI, BY, ZY (10); Physical Science Elective from CH, PHS, PS (5); MH Elective (5).

Electives from Above: 10 Hrs. Physical Science Elective from above (5); Humanities or Social Science Electives from above (5).

Health and Physical Ed.: 4 Hrs. PE Elective (1-3); Health Education Elective (1-3).

Electives: 16 Hrs. VED 346 or 541 Development/History of Vocational Education (3-4); VED 466 Teaching Out of School Groups (3); Free Electives (9-10).

Curriculum and Teaching and Media: 10 Hrs. EM 200 Educational Media (2); VED 414 Program in Area of Specialization (3); VED 415 Teaching in Area of Specialization (5).

Reading: 5 Hrs. SED 570 Reading in Content Area (5).

Area of Specialization: 55 Hrs. MN 310 Principles of Management (3); MN 500 Industrial Relations (5); VED 405 The School Shop (3); VED 510 Occupational Information or VED 550 Career Education (3-4); VED 558 Coordination (5); VED 475-480 Trade & Technical Experience (5-30); VED 462 Directed Work Experience (1-15).

*See Departmental Adviser for Approval of Electives prior to enrolling.

ART, N-12

Humanities and Fine Arts: 22 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved Literature Elective* (3); AT 112, 113 Visual Arts (10).

Social Sciences: 20 Hrs. EC 200 Economics (5); AT 171, 172, 173 Art History (9); Approved Social Science Electives* from HY, PO, SY (6).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Elective from BI, BY, ZY, VM (5); Physical Science Elective from PHS, PS, CH, GL, AM, AY (5); Mathematics Elective from MH (5); Mathematics or Science Elective from Above (5).

Electives from Above: 10 Hrs. AT 111 Fundamentals (5); Electives from Social Science or Mathematics or Science above (5).

Health and Physical Ed.: 4 Hrs. PE Elective (1-3); Health Education Elective (1-3).

Electives: 16 Hrs. AT 121, 122 Fundamentals (10); CA 345 Creative Crafts (2-3); CA 375 Creative Ceramics (1-2).

Curriculum and Teaching and Media: 15 Hrs. EM 200 Educational Media (2); SED 201-A Art Expression (2); IED 414A Teaching in Area of Specialization (3); IED 423A Program in Area of Specialization (3); Approved Electives* in Curriculum/Teaching/Media (5).

Reading: 5 Hrs. SED 570 Reading in Content Areas (5).

Area of Specialization: 60 Hrs. AT 121, 122, 123 Fundamentals (15); AT 211 Figure Drawing (5); AT 301 Elementary School Art (5); AT 231 Oil Painting or AT 232 Transparent Water Color or AT 233 Opaque Water Color (10); AT 241 Relief Printmaking or AT 242 Intaglio Printmaking or AT 243 Planographic Printmaking (5); AT 251 Modeling Construction or AT 252 Wood Sculpture or AT 253 Stone Sculpture (5); Approved 300 level or above Electives* in AT, CA, EM or TH (15).

*See Departmental Adviser for Approval of Electives prior to enrolling.

HEALTH EDUCATION, N-6

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); EH 260, 261, 262 World Literature (9); Fine Arts Elective from MU, AT, TH and/or Dance (2).

Social Sciences: 20 Hrs. EC 200 Economics or EC 340 Environmental Economics (5); SY 201 Introduction to Sociology (5); SY 220 Statistics (5); HY select from HY 103 or 206 or 201 or 202 World History, Technology and Civilization or U.S. History (5).

Natural and Physical Science and Mathematics: 20 Hrs. BI 101 Principles of Biology (5); ZY 250 Anatomy (5); CH 201 Descriptive Chemical Science (5); MH 140 College Algebra (or higher) (5).

Electives from Above: 10 Hrs. ZY 251 Physiology (5); Approved Social Science Elective* from EC, PA, PG, PO, RSY, HY, GY (5).

Health and Physical Ed.: 4 Hrs. PE 101 Foundations of Physical Education (1); HPR 195 Health Science (3).

Electives: 16 Hrs. SC 202 Speech Communication (3); Free Electives (13).

Curriculum and Teaching and Media: 16 Hrs. EM 200 Educational Media (2); HPR 394 Elementary Health Instruction (3); HPR 414A Teaching Health Education (3); HPR 423A Program in Health Education (3); HPR 519 Current Problems in Health Education or HPR 594 Sex Education for Teachers or HPR 596 Perspectives on Health Education or HPR 597 Drug Abuse Education (5).

Reading: 5 Hrs. EED 570 Reading in Content Area (5).

Area of Specialization: 60 Hrs. BY 201 Microbes & Man (5); HPR 195 Health Science (3); HPR 295 School Health (3); HPR 296 Community Health (3); HPR 396 Drug Use and Abuse (3); HPR 494 Emergency Care (3); NF 112 Nutrition and Man (3); ZY 250 Anatomy (5); ZY 251 Physiology (5); Approved Electives* as follows to include 14 hours 300 level or above: Family Health (3-5); Health Administration (5); Consumer Health (3-5) Health Education (12-16).

*See Departmental Adviser for Approval of Electives prior to enrolling.

HEALTH EDUCATION, N-12

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); EH 260, 261, 262 World Literature (9); Fine Arts Elective from MU, AT, TH and/or Dance (2).

Social Sciences: 20 Hrs. EC 200 Economics or EC 340 Environmental Economics (5); SY 201 Introduction to Sociology (5); SY 220 Statistics (5); HY select from HY 103 or 206 or 201 or 202 World History, Technology and Civilization or U.S. History (5).

Natural and Physical Science and Mathematics: 20 Hrs. BI 101 Principles of Biology (5); ZY 250 Anatomy (5); CH 201 Descriptive Chemical Science (5); MH 140 College Algebra (or higher) (5).

Electives from Above: 10 Hrs. ZY 251 Physiology (5); Approved Social Science Elective* from EC, PA, PG, PO, RSY, HY, GY (5).

Health and Physical Ed.: 4 Hrs. PE 101 Foundations of Physical Education (1); HPR 195 Health Science (3).

Electives: 16 Hrs. SC 202 Speech Communication (3); Free Electives (13).

Curriculum and Teaching and Media: 16 Hrs. EM 200 Educational Media (2); HPR 394 Elementary Health Instruction or HPR 395 Secondary Health Instruction (3); HPR 414A Teaching in Health Education (3); HPR 423A Program in Health Education (3); HPR 519 Current Problems in Health Education or HPR 594 Sex Education for Teachers or HPR 596 Perspectives on Health Education or HPR 597 Drug Abuse (5).

Reading: 5 Hrs. EED 570 Reading in Content Area or SED 570 Reading in Content Area.

Area of Specialization: 60 Hrs. BY 201 Microbes & Man (5); HPR 195 Health Science (3); HPR 295 School Health (3); HPR 296 Community Health (3); HPR 396 Drug Use and Abuse (3); HPR 494 Emergency Care (3); NF 112 Nutrition and Man (3); ZY 250 Anatomy (5); ZY 251 Physiology (5); Approved Electives* as follows to include 14 hours 300 level or above: Family Health (3-5); Health Administration (5); Consumer Health (3-5); Health Education (12-16).

*See Departmental Adviser for Approval of Electives prior to enrolling.

HEALTH EDUCATION, 7-9

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); EH 260, 261, 262 World Literature (9); Fine Arts Elective from MU, AT, TH and/or Dance (2).

Social Sciences: 20 Hrs. EC 200 Economics or EC 340 Environmental Economics (5); SY 201 Introduction to Sociology (5); SY 220 Statistics (5); HY select from HY 103 or 206 or 201 or 202 World History, Technology and Civilization or U.S. History (5).

Natural and Physical Science and Mathematics: 20 Hrs. BI 101 Principles of Biology (5); ZY 250 Anatomy (5); CH 201 Descriptive Chemical Science (5); MH 140 College Algebra or higher (5).

Electives from Above: 10 Hrs. ZY 251 Physiology (5); Approved Social Science Elective* from EC, PA, PG, PO, RSY, HY, GY (5).

Health and Physical Ed.: 4 Hrs. PE 101 Foundations of Physical Education (1); HPR 195 Health Science (3).

Electives: 16 Hrs. SC 202 Speech Communication (3); Free Electives (13).

Curriculum and Teaching and Media: 17 Hrs. EM 200 Educational Media (2); HPR 394 Elementary Health Instruction or HPR 395 Secondary Health Instruction (3); HPR 414A Teaching Health Education (3); HPR 423A Program in Health Education (3); Teaching and Program in 2nd major (6).

Reading: 10 Hrs. EED 570 Reading in Content Area (5); SED 570 Reading in Content Area (5).

Area of Specialization: 40 Hrs. BY 201 Microbes and Man (5); HPR 195 Health Science (3); HPR 295 School Health (3); HPR 296 Community Health (3); HPR 396 Drug Use and Abuse (3); HPR 494 Emergency Care (3); NF 112 Nutrition and Man (3); ZY 250 Anatomy (5); ZY 251 Physiology (5); Approved 300 Level or Higher Health Electives* (7).

*See Departmental Adviser for Approval of Electives prior to enrolling.

HEALTH EDUCATION, 10-12

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); EH 260, 261, 262 World Literature (9); Fine Arts Elective from MU, AT, TH and/or Dance (2).

Social Sciences: 20 Hrs. EC 200 Economics or EC 340 Environmental Economics (5); SY 201 Introduction to Sociology (5); SY 220 Statistics (5); HY select from HY 103 or 206 or 201 or 202 World History, Technology and Civilization or U.S. History (5).

Natural and Physical Science and Mathematics: 20 Hrs. BI 101 Principles of Biology (5); ZY 250 Anatomy (5); CH 201 Descriptive Chemical Science (5); MH 140 College Algebra or Higher (5).

Electives from Above: 10 Hrs. ZY 251 Physiology (5); Approved Social Science Elective* from above (5).

Health and Physical Ed.: 4 Hrs. PE 101 Foundations of Physical Education (1); HPR 195 Health Science (3).

Electives: 16 Hrs. SC 202 Speech (3); Electives (13).

Curriculum and Teaching and Media: 11 Hrs. EM 200 Educational Media (2); HPR 395 Secondary Health Instruction (3); HPR 414A Teaching Health Education (3); HPR 423A Program in Health Education (3).

Reading: 5 Hrs. SED 570 Reading in Content Area (5).

Area of Specialization: 40 Hrs. BY 201 Microbes and Man (5); HPR 195 Health Science (3); HPR 295 School Health (3); HPR 296 Community Health (3); HPR 396 Drug Use and Abuse (3); HPR 494 Emergency Care (3); NF 112 Nutrition and Man (3); ZY 250 Anatomy (5); ZY 251 Physiology (5); Approved Electives* 300 level or higher (7).

*See Departmental Adviser for Approval of Electives prior to enrolling.

PHYSICAL EDUCATION, N-6

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); EH 260, 261, 262 World Literature (9); Fine Arts Electives from AT, MU, AR 360, HPR 370, 373; CA 116, 116L, 345 and/or 375 (2).

Social Sciences: 20 Hrs. EC 200 Economics (5); PG 211 Psychology (5); SY 201 Introduction to Sociology (5); HY Elective from HY 103 or 206 or 201 or 202 World, Technology & Civilization or U.S. History (5).

Natural and Physical Science and Mathematics: 20 Hrs. BI 101 Principles of Biology (5); PS 200 Physics (5); ZY 250 Anatomy (5); MH 140 or Higher (5).

Electives from Above: 10 Hrs. CH 201 Descriptive Chemical Science (5); Approved Electives* from Humanities or Social Sciences above (5).

Health and Physical Ed.: 4 Hrs. PE 101 Foundations of Physical Education (1); HPR 195 Health Science (3).

Electives: 16 Hrs. ZY 251 Physiology (5); SC 202 Speech Communication (3); PE Electives (2); Free Electives (6).

Curriculum and Teaching and Media: 15 Hrs. EM 200 Educational Media (2); HPR 414-B Teaching Physical Education (3); HPR 423-B Program in Physical Education (5); MED 304 Music and Related Arts (5).

Reading: 5 Hrs. EED 570 Reading in Content Area (5).

Area of Specialization: 61 Hrs. HPR 118, 119 Skills & Concepts Individual & Dual Activities (6); HPR 120 Skills & Concepts Gymnastics (4); HPR 121 Skills & Concepts Aquatics (2); HPR 122 Skills & Concepts Team Sports (3); HPR 123 Skills & Concepts Dance (3); HPR 201 History & Principles of Physical Education (3); HPR 211 Sensorimotor Activities (3); HPR 212 Elementary School Activities (3); HPR 213 Dance for Children (3); HPR 315 Kinesiology (4); HPR 405 Physiology of Exercise (4); HPR 416 Adaptive Physical Education (3); HPR 426 Measurement & Evaluation in Physical Education (3); HPR 429 Motor Learning & Performance (3); HPR 494 Emergency Care & First Aid (3); FCD 267 Child Development I (3); NF 112 Nutrition & Man (3); TH 307 or 308 Children's Theatre or Creative Dramatics (3).

*See Departmental Adviser for Approval of Electives prior to enrolling.

PHYSICAL EDUCATION, N-12

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); EH 260, 261, 262 World Literature (9); Fine Arts Electives from AT, MU, AR 360, HPR 370, 373; CA 116, 116L, 345 and/or 375 (2).

Social Sciences: 20 Hrs. EC 200 Economics (5); PG 211 Psychology (5); HY 103 or 206 or 201 or 202 (3-5); Approved Social Science Electives* from SY, EC, HY, GY, PG, ANTI, PO (5-7).

Natural and Physical Science and Mathematics: 20 Hrs. BI 101 Principles of Biology (5); PS 200 Physics (5); ZY 250 Anatomy (5); MH 140 or Higher (5).

Electives from Above: 10 Hrs. CH 201 Descriptive Chemical Science (5); Approved Electives* from Humanities or Social Sciences above (5).

Health and Physical Ed.: 4 Hrs. PE 101 Foundations of Physical Education (1); HPR 195 Health Science (3).

Electives: 16 Hrs. ZY 251 Physiology (5); SC 202 Speech Communication (3); PE Electives (2); Free Electives (6).

Curriculum and Teaching and Media: 16 Hrs. EM 200 Educational Media (2); HPR 414B Teaching in Physical Education (3); HPR 423B Program in Physical Education (5); HPR 207 Conduct of Dance or HPR 208 Theory & Conduct of Team Sports or HPR 209 Theory & Conduct of Individual & Dual Sports or HPR 210 Theory & Conduct of Gymnastics or HPR 351 Water Safety (6).

Reading: 5 Hrs. EED 570 or SED 570 Reading in Content Area (5).

Area of Specialization: 70 Hrs. HPR 118, 119 Skills & Concepts Individual & Dual Activities (6); HPR 120 Skills & Concepts Gymnastics (4); HPR 121 Skills & Concepts Aquatics (2); HPR 122 Skills & Concepts Team Sports (3); HPR 123 Skills & Concepts Dance (4); HPR 201 History & Principles of Physical Education (3); HPR 212 Elementary School Activities (3); HPR 315 Kinesiology (4); HPR 405 Physiology of Exercise (4); HPR 416 Adaptive Physical Education (3); HPR 426 Evaluation of Measurement in Physical Education (3); HPR 429 Motor Learning & Performance (4); HPR 494 Emergency Care & First Aid (3); HPR 202 or 203 or 204 or 205 Basketball, Baseball, Track & Field, Football (3); Approved Electives in PE* (2) and HPR (9).

*See Departmental Adviser for Approval of Electives prior to enrolling.

PHYSICAL EDUCATION, 7-9

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); EH 260, 261, 262 World Literature (9); Fine Arts Electives from AT, MU, AR 360, HPR 370, 373, CA 116, 116L, 345 and/or 375 (2).

Social Sciences: 20 Hrs. EC 200 Economics (5); PG 211 Psychology (5); HY 103 or 206 or 201 or 202 (3-5); Approved Social Science Electives* from SY, EC, HY, GY, PG, ANT, PO (5-7).

Natural and Physical Science and Mathematics: 20 Hrs. BI 101 Principles of Biology (5); PS 200 Physics (5); ZY 250 Anatomy (5); MH 140 or Higher (5).

Electives from Above: 10 Hrs. CH 201 Descriptive Chemical Science (5); Approved Electives* from Humanities or Social Sciences above (5).

Health and Physical Ed.: 4 Hrs. PE 101 - Foundations of Physical Education (1); HPR 195 Health Science (3).

Electives: 16 Hrs. ZY 251 Physiology (5); SC 202 Speech Communication (3); PE Electives (2); Free Electives (6).

Curriculum and Teaching and Media: 16 Hrs. EM 200 Educational Media (2); HPR 414-B Teaching Physical Education (3); HPR 423-B Program in Physical Education (5); Teaching and Program in 2nd major (6).

Reading: 10 Hrs. EED 570 Reading in Content Area (5); SED 570 Reading in Content Area (5).

Area of Specialization: 43 Hrs. HPR 118, 119 Skills and Concepts Individual & Dual Activities I, II (6); HPR 120 Skills and Concepts Gymnastics (4); HPR 121 Skills and Concepts Aquatics (2); HPR 122 Skills and Concepts Team Sports (3); HPR 123 Skills and Concepts Dance (4); HPR 201 History & Principles of Physical Education (3); HPR 315 Kinesiology (4); HPR 405 Physiology of Exercise (4); HPR 416 Adaptive Physical Education (3); HPR 426 Measurement & Evaluation in Physical Education (3); HPR 429 Motor Learning & Performance (4); HPR 494 Emergency Care & First Aid (3).

*See Departmental Adviser for Approval of Electives prior to enrolling.

PHYSICAL EDUCATION, 10-12

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); EH 260, 261, 262 World Literature (9); Fine Arts Electives from AT, MU, AR 360, HPR 370, 373, CA 116, 116L, 345, and/or 375 (2).

Social Sciences: 20 Hrs. EC 200 Economics (5); PG 211 Psychology (5); HY 103 or 206 or 201 or 202 (3-5); Approved Social Science Electives* from SY, EC, HY, GY, PG, ANT, PO (5-7).

Natural and Physical Science and Mathematics: 20 Hrs. BI 101 Principles of Biology (5); ZY 250 Anatomy (5); PS 200 Foundations of Physics (5); MH 140 College Algebra or Higher MH (5).

Electives from Above: 10 Hrs. CH 201 Descriptive Chemical Science (5); Elective from Humanities or Social Science Above (5).

Health and Physical Ed.: 4 Hrs. PE 101-Foundations of Physical Education (1); HPR 195 Health Science (3).

Electives: 16 Hrs. ZY 251 Physiology (5); SC 202 Speech (3); PE Electives (2); Free Electives (6).

Curriculum and Teaching and Media: 10 Hrs. EM 200 Educational Media (2); HPR 414B Teaching Physical Education (3); HPR 423B Program in Physical Education (5).

Reading: 5 Hrs. SED 570 Reading in Content Area (5).

Area of Specialization: 43 Hrs. HPR 118, 119 Skills and Concepts Individual Activities I, II (6); HPR 120 Skills and Concepts Gymnastics (4); HPR 121 Skills and Concepts Aquatics (2); HPR 122 Skills and Concepts Team Sports (3); HPR 123 Skills and Concepts Dance (4); HPR 201 History and Principles Physical Education (3); HPR 315 Kinesiology (4); HPR 405 Physiology of Exercise (4); HPR 416 Adaptive Physical Education (3); HPR 426 Measurement and Evaluation in Physical Education (3); HPR 429 Learning and Performance (4); HPR 494 Emergency Care & First Aid (3).

*See Departmental Adviser for Approval of Electives prior to enrolling.

INDUSTRIAL ARTS, N-12

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved SC Elective* (3); EH 260 and/or 261 and/or 262 World Literature (6); Fine Arts Electives from AT, MU, CA 116 (2); (JM 316 approved as humanities elective).

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 103 or 206 World History or Technology & Civilization (3); Social Science Electives from ANT, EC, GY, HY, PG, PO, SY (12).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Elective from BI, BY, ZY (5); Physical Science Electives from PHS, CH, PS (10); MH Elective (5).

Electives from Above: 10 Hrs. Social Science Elective from above (5); Physical Science Elective from PHS, CH, PS (5).

Health and Physical Ed.: 4 Hrs. PE Elective (1-3); Health Education Elective (1-3).

Electives: 16 Hrs. VED 346 or 541 Development/History of Vocational Education (3-4); VED 200, Typewriting I (3); VED 246 Instructional Drawing (3); MN 310 Principles of Management (4); VED 405 School Shop (3).

Curriculum and Teaching and Media: 15 Hrs. EM 200 Educational Media (2); VED 414 Program in Area of Specialization (3); VED 415 Teaching in Area of Specialization (5); VED 556 Learning Resources (5).

Reading: 5 Hrs. SED 570 Reading in Content Area (5).

Area of Specialization: 63 Hrs. TS 102 Engineering Drawing I (2); TS 105 Engineering Drawing II, or TS 108 Design for Management (2); VED 246 Instructional Drawing (3); VED 200 Typing (3); VED 403 Principles of Electricity (1); VED 407 Practicum in Electricity (4); VED 409 Teaching Electronics in Industrial Arts (4); VED 457 Practicum in Graphic Arts (3); VED 406 Practicum in Building Construction and Maintenance (5); VED 404 Practicum in General Metals (5); TS 111 Woodworking (1); TS 112 Welding Science and Application (1); TS 113 Machine Tool Laboratory (1); TS 114 Sheet Metal Design and Fabrication; TS 115 Foundry Technology (1); TS 216 Plastics Technology (1); VED 400 Introduction to Power Mechanics (5); VED 401 Practicum in Small Gasoline Engines (5); VED 402 Automotive Construction and Repair (5); CA 345 Creative Crafts (3); VED 405 The School Shop (3); MN 310 Principles of Management (3).

*See Departmental Adviser for Approval of Electives prior to enrolling.

MUSIC, INSTRUMENTAL N-12

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); EH 260, 261 World Literature (6); MU 131 Materials & Organization of Music (5).

Social Sciences: 21-22 Hrs. EC 200 Economics (5); Approved Social Science* from HY US/AM/World History or PO (5-6); SY 201 Introduction to Sociology (5); MU 351, 352 Music History (6).

Natural and Physical Science and Mathematics: 20 Hrs. BI 101 Principles of Biology (5); Physical Science Elective from PHS, PS, CH, GL, AM, AY (5); Mathematics Elective MH (5); Natural Science Elective from BI, BY, ZY (5).

Electives from Above: 11 Hrs. MU 132 Materials and Organization of Music (5); EH 262 World Literature (3); MU 353 Music History (3).

Health and Physical Ed.: 4 Hrs. PE Elective (1-3); Health Education Elective (1-3).

Electives: 18 Hrs. MU 133, 231, 232 Materials & Organization of Music (15); Approved Speech Elective SP* (3).

Curriculum and Teaching and Media: 15 Hrs. EM 200 Educational Media (2); MU(T) 409 Marching Band Techniques or MU(T) 410 Conducting Techniques (3); MED 394 Teaching Elementary School Music (3); MED 593 Material & Organization of School Orchestras or MED 594 Material & Organization of School Bands (3); MU(T) or MED Electives (4).

Reading: 5 Hrs. EED 570 or SED 570 Reading in Content Area (5).

Area of Specialization: 64 Hrs. Applied Music MUA 187, 188, 189 (3); MUA 297, 288, 289 (3); MUA 387, 388, 389 (3); MUA 487, 488 (3); MUA 184, 185, 186 (3); MUA 284, 285, 286 (3); MU 233 Material & Organization of Music (5); MU 351, 352, 353 Music History (9); MU 361, 362, 363 Conducting (5); MU Ensembles (11); MU(T) 110-119 Instruments Class (8); MU 454 Instrumental Literature (3); MU 477 or 537 Music Arranging or Orchestration (3); MU, MU(T) or MED Electives (3).

*See Departmental Adviser for Approval of Electives prior to enrolling.

MUSIC, VOCAL/CHORAL, N-12

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); EH 260, 261 World Literature (6); MU 131 Materials & Organization of Music (5).

Social Sciences: 21-22 Hrs. EC 200 Economics (5); Approved Social Science* from HY US/AM/World History or PO (5-6); SY 201 Introduction to Sociology (5); MU 351, 352 Music History (6).

Natural and Physical Science and Mathematics: 20 Hrs. BI 101 Principles of Biology (5); Physical Science Elective from PHS, PS, CH, GL, AM, AY (5); Mathematics Elective MH (5); Natural Science Elective from BI, BY, ZY (5).

Electives from Above: 11 Hrs. MU 132 Materials and Organization of Music (5); EH 262 World Literature (3); MU 353 Music History (3).

Health and Physical Ed.: 4 Hrs. PE Elective (1-3); Health Education Elective (1-3).

Electives: 18 Hrs. MU 133, 231, 232 Materials & Organization of Music (15); Approved Speech Elective SP* (3).

Curriculum and Teaching and Media: 15 Hrs. EM 200 Educational Media (2); MU(T) 411 Choral Techniques (3); MED 304 Music and Related Arts (3); MED 595 Material & Organization of School Choirs (3); MU(T) or MED Electives (4).

Reading: 5 Hrs. EED 570 or SED 570 Reading in Content Areas (5).

Area of Specialization: 64 Hrs. Applied Music MUA 187, 188, 189 (3); MUA 287, 288, 289 (3); MUA 387, 388, 389 (3); MUA 487, 488 (2); MUA 184, 185, 186 (3); MUA 284, 285, 286 (3); MU 233 Material & Organization of Music (5); MU 351, 352, 353 Music History (9); MU 361, 362, 363 Conducting (5); MU Ensembles (11); MU(T) 442 Vocal Pedagogy (3); MU 478 Music Arranging (3); MU 553 Choral Literature (3); MU, MU(T) or MED Electives (8).

*See Departmental Adviser for Approval of Electives prior to enrolling.

MUSIC, GENERAL N-9

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); EH 260, 261 World Literature (6); MU 131 Materials & Organization of Music (5).

Social Sciences: 21-22 Hrs. EC 200 Economics (5); Approved Social Science* from HY US/AM/World History or PO (5-6); SY 201 Introduction to Sociology (5); MU 351, 352 Music History (6).

Natural and Physical Science and Mathematics: 20 Hrs. BI 101 Principles of Biology (5); Physical Science Elective from PHS, PS, CH, GL, AM, AY (5); Mathematics Elective MH (5); Natural Science Elective from BI, BY, ZY (5).

Electives from Above: 11 Hrs. MU 132 Materials and Organization of Music (5); EH 262 World Literature (3); MU 353 Music History (3).

Health and Physical Ed.: 4 Hrs. PE Elective (1-3); Health Education Elective (1-3).

Electives: 18 Hrs. MU 133, 231, 232 Materials & Organization of Music (15); Approved Speech Elective SP* (3).

Curriculum and Teaching and Media: 15 Hrs. EM 200 Educational Media (2); MED 304 Music and Related Arts (3); MED 396 Early Childhood, Elementary Music Program (3); MU(T) or MED Electives in Curriculum or Teaching (7).

Reading: 5 Hrs. EED 570 or SED 570 Reading in Content Area (5).

Area of Specialization: 60 Hrs. Applied Music MUA 187, 188, 189 (3); MUA 287, 288, 289 (3); MUA 387, 388, 389 (3); MUA 487, 488 (2); MUA 184, 185, 186 (3); MUA 284, 285, 286 (3); MU 233 Material & Organization of Music (5); MU 351, 352, 353 Music History (9); MU 361, 362, 363 Conducting (5); MU Ensembles (11); MU(T) 411 Choral Techniques (3); MU 477 or 478 or 537 Music Arranging or Orchestration (3); MED 597 Organization of General Music Programs (4); Select (3-4) from: MU(T) 101-103, 110-119 Instrument Classes or MU, MU(T), MED Approved Electives*.

*See Departmental Adviser for Approval of Electives prior to enrolling.

SPEECH COMMUNICATION/THEATRE, N-12

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved Literature Elective* (3); Fine Arts Elective from AT, MU, Dance (1-3); Humanities Elective from AT, EH, FL, MU, PA, RL, SC, TH (5-7).

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 101 or 204; 102 or 205; 103 or 206; World History or Technology & Civilization (9); Approved Social Science Electives* from EC, GY, HY, PO, PG, SY (6).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Elective from BI, BY, ZY, VM (5); Physical Science Elective from PHS, PS, CH, GL, AM 304, AY 310 (5); Mathematics Elective MH (5); Mathematics or Science Elective from above (5).

Electives from Above: 10 Hrs. Humanities Elective from above (1-9); Social Science or Mathematics or Science Electives from above (1-9).

Health and Physical Ed.: 4 Hrs. PE Elective (1-3); Health Education Elective (1-3).

Electives: 16 Hrs. Free Electives (16).

Curriculum and Teaching and Media: 16 Hrs. EM 200 Educational Media (2); IED 414C Dramatic Arts (3); IED 414M Speech Communication (3); IED 423C Program in Dramatic Arts (3); IED 423M Program in Speech Communication (3); SED 495 Practicum (1-2); SED 201Q Materials of Instruction (1-2).

Reading: 5 Hrs. EED 570 or SED 570 Reading in Content Area (5).

Area of Specialization: 60 Hrs. SC 200 Introduction to Speech Communication (5); SED 201P Communication Problems (2); SC 211 Public Speaking (5); SC 273 Group Problem Solving (5); SC 301 Speech Communication Theories (5); SC 320 Fundamentals of Oral Interpretation of Literature (5); SC 340 The Speech and Hearing Mechanism (5); SC 378 Argument & Debate (5); TH 104, 105, 106 Introduction to Theatre (9); TH 107, 108, 109 Stagecraft (3); TH 307 or 308 Children's Theatre or Creative Dramatics (3); TH 404 Directing I (3); TH/SC Electives (5).

*See Departmental Adviser for Approval of Electives prior to enrolling.

EARLY CHILDHOOD FOR HANDICAPPED, N-3

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); EH 260 or 261 or 262 World Literature (3); Approved Literature Electives* (5); AT 171 or 172 or 173 History of World Art (3).

Social Sciences: 20 Hrs. EC 200 Economics (5); PG 211 Psychology (5); SY 201 Introduction to Sociology (5); Approved Social Science Elective* (5).

Natural and Physical Science and Mathematics: 20 Hrs. BI 101 Principles of Biology (5); Natural Science Selected from BI 104 or 102 or 103 or ZY 105 or 250 (5); Approved Physical Science Elective* (5); Mathematics selected from MH 100 or 140 or 151 or 160 or 161 or 281 (5).

Electives from Above: 10 Hrs. EH 304 or 315 Technical Writing or Business & Professional Writing (3); HY 103 or 206 World History or Technology & Civilization (3); Approved Elective Social Science*, Science or Mathematics (4).

Health and Physical Ed.: 4 Hrs. PE Elective (1-3); Health Education Elective (1-3).

Electives: 16 Hrs. RSE 104 Introduction to Laboratory Experiences (1); RSE 495 Practicum (5); RSE 479 Methods (5); RSE 377 Introduction to Mental Retardation or RSE 378 Introduction to Behavior Disturbance or RSE 529 Introduction to Learning Disabilities (5).

Curriculum and Teaching and Media: 21 Hrs. EM 200 Educational Media (2); RSE 300A Curriculum, N-4 (5); RSE 588 Infant Stimulation (4); RSE 420 Organizing Instruction (5); RSE 550 Language Development of the Handicapped (5).

Reading: 10 Hrs. EED 370, 371 Fundamentals of Reading I, II (10).

Area of Specialization: 40 Hrs. SC 202 Speech Communication (3); HPR 211 Sensorimotor Activities (3); AT 301 Art for Teachers (5); MU 371 Music for Teacher (3); FCD 267 Child Development I (4); FCD 300 Approach to Child Study (5); FCD 301 Child Development II (4); EED 304 Music and Related Arts (5); EM 510 Media for Children (4); RSE 587 Education for Parents of Handicapped Children (4).

*See Departmental Adviser for Approval of Electives prior to enrolling.

EMOTIONALLY CONFLICTED, N-12

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); EH 260 or 261 or 262 World Literature (3); Approved Literature Elective* (5); AT 171 or 172 or 173 History of World Art (3).

Social Sciences: 20 Hrs. EC 200 Economics (5); PG 211 Psychology (5); SY 201 Introduction to Sociology (5); PG 315 Quantitative Methods or Approved Social Science Elective* from PG, SY, PA, EC, ANT, GY, SW, HY, PO (5).

Natural and Physical Science and Mathematics: 20 Hrs. BI 101 Principles of Biology (5); Natural Science Elective from BI 104 or 102 or 103 or ZY 105 or 250 (5); PHS 100 Physical Science or Approved Physical Science* from PS, GL, CH, AM 304, or AY 310 (5); MH 100 or 140 or 151 or 160 or 281 Mathematics (5).

Electives from Above: 10 Hrs. EH 304 or 315 Technical Writing or Business & Professional Writing (3); HY 103 or 206 World History or Technology & Civilization (3); Approved* Elective from Social Science, Mathematics or Science above (4).

Health and Physical Ed.: 4 Hrs. PE Elective (1-3); Health Education Elective (1-3).

Electives: 16 Hrs. Approved* Electives (16).

Curriculum and Teaching and Media: 15 Hrs. EM 200 Educational Media (2); EED 370 Fundamentals of Reading Instruction I (5); RSE 300 Curriculum & Teaching N-4 (4); RSE 301 Curriculum & Teaching 5-12 (4).

Reading: 5 Hrs. EED 570 or SED 570 Reading in Content Area (5).

Area of Specialization: 60 Hrs. RSE 104 Orientation to Special Education (1); RSE 420 Organizing Instruction in Special Education (5); RSE 421 Educational Diagnosis & Assessment in Special Education (5); RSE 450 Special Topics (5); RSE 446 Directed Independent Study (4-6); RSE 586 Teaching the Severely (Profoundly Handicapped) (3); VED 550 Career Education (4); Choose two from RSE 377 Introduction to Mental Retardation; SC 350/450 Introduction to Speech Pathology/Audiology; RSE 529 Learning Disabilities; RSE 550 Language Development for Young Handicapped Child; SC 552 Language Disorders; RSE 587 Parent Education for Exceptional Children (9-10); RSE 378 Introduction to Behavior Disturbance (5); RSE 479 Methods & Materials for Teaching in Special Education (5); RSE 495 Practicum (5-7); PG 350 Behavior Modification in Early Childhood (5); PG 435 or 536 Abnormal Psychology of Psychology of Abnormal Children and Adolescents (4-5).

*See Departmental Adviser for Approval of Electives prior to enrolling.

MENTALLY RETARDED, N-12

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); EH 260 or 261 or 262 World Literature (3); Approved Literature Elective* (5); AT 171 or 172 or 173 History of World Art (3).

Social Sciences: 20 Hrs. EC 200 Economics (5); PG 211 Psychology (5); SY 201 Introduction to Sociology (5); PG 315 Quantitative Methods or Approved Social Science Elective* from PG, SY, PA, EC, ANT, GY, SW, HY, PO (5).

Natural and Physical Science and Mathematics: 20 Hrs. BI 101 Principles of Biology (5); Natural Science Elective from BI 104 or 102 or 103 or ZY 105 or ZY 250 (5); PHS 100 Physical Science or Approved Physical Science* from PS, GL, CH, AM 304 or AY 310 (5); MH 100 or 140 or 151 or 160 or 161 or 281 Mathematics (5).

Electives from Above: 10 Hrs. EH 304 or 315 Technical Writing or Business & Professional Writing (3); HY 103 or 206 World History or Technology & Civilization (3); Approved Elective* from Social Science, Mathematics or Science Above (4).

Health and Physical Ed.: 4 Hrs. PE Elective (1-3); Health Education Elective (1-3).

Electives: 16 Hrs. Approved Electives* (16).

Curriculum and Teaching and Media: 15 Hrs. EM 200 Educational Media (2); EED 370 Fundamentals of Reading Instruction I (5); RSE 300 Curriculum and Teaching N-4 (4); RSE 301 Curriculum and Teaching 5-12 (4).

Reading: 5 Hrs. EED 570 or SED 570 Reading in Content Area (5).

Area of Specialization: 60 Hrs. RSE 104 Orientation to Special Education (1); RSE 420 Organizing Instruction in Special Education (5); RSE 421 Educational Diagnosis & Assessment in Special Education (5); RSE 450 Special Topics (5); RSE 446 Directed Independent Study (4-6); RSE 586 The Severely Handicapped (3); VED 550 Career Education (4); RSE 378 Introduction to Behavior Disturbance (5); SC 350/450 Introduction to Speech Pathology/Audiology (5); RSE 523 Learning Disabilities (5); RSE 550 Language Development for Young Handicapped Children (5); SC 552 Language Disorders (5); RSE 567 Parent Education for Exceptional Children (4); RSE 377 Introduction to Mental Retardation (5); RSE 479P Methods & Materials for Teaching MR (5); RSE 495P Practicum Mild Mental Retardation (2); RSE 495P Practicum - Moderate Mental Retardation (2); RSE 495P Practicum - Severely Handicapped (2); HPR 517P Physical Education for the Mentally Retarded (3); RSE 585 The Moderately Mentally Retarded (3).

*See Departmental Adviser for Approval of Electives prior to enrolling.

SPEECH PATHOLOGY, N-12

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); EH 260 or 261 or 262 World Literature (3); Approved Literature Elective* (5); AT 171 or 172 or 173 History of World Art (3).

Social Sciences: 20 Hrs. EC 200 Economics (5); PG 211 Psychology (5); SY 201 Introduction to Sociology (5); PG 315 Quantitative Methods or Approved Social Science Elective* from PG, SY, PA, EC, ANT, GY, SW, HY, PO (5).

Natural and Physical Science and Mathematics: 20 Hrs. BI 101 Principles of Biology (5); Natural Science Elective from BI 104 or 102 or 103 or ZY 105 or ZY 250 (5); PHS 100 Physical Science or Approved Physical Science* from PS, GL, CH, AM 304 or AY 310 (5); MH 100 or 140 or 151 or 160 or 161 or 281 Mathematics (5).

Electives from Above: 10 Hrs. EH 304A or 315A Technical Writing or Business & Professional Writing (3); HY 103 or 206 World History or Technology & Civilization (3); Approved Elective* from Social Science, Mathematics or Science above (4).

Health and Physical Ed.: 4 Hrs. PE Elective (1-3); Health Education Elective (1-3).

Electives: 16 Hrs. Approved Electives* (16).

Curriculum and Teaching and Media: 15 Hrs. EM 200 Educational Media (2); RSE 420 N Organization of Instruction in Speech Pathology (5); SC 341 Phonetics (3); RSE 479 Methods & Materials in Speech Pathology (5).

Reading: 5 Hrs. EED 570 or SED 570 Reading in Content Area (5).

Area of Specialization: 60 Hrs. RSE 104 Orientation to Speech Pathology (1); SC 340 Speech and Hearing Mechanism (5); RSE 421 Educational Diagnosis & Assessment in Special Education (5); SC 350 Introduction to Speech Pathology & Audiology (5); SC 455 Introduction to Clinical Practice in Speech Pathology (1); SC 456 Clinical Instrumentation & Testing in Speech Pathology (1); SC 457 Therapeutic Procedures in Speech Pathology (2); SC 458 Advanced Therapeutic Procedures in Speech Pathology (2); SC 551 Articulation Disorders (5); SC 552 Language Disorders (5); SC 553 Fluency Disorders (5); SC 554 Voice Disorder (5); SC 560 Introduction to Audiology (5); SC 561 Hearing Pathology (5); SC 562 Hearing Evaluation/Rehabilitation/Conservation (5); SC 465 Introduction to Clinical Procedures or SC 446 Audiological Evaluation Procedures (1-2); RSE 446 N Independent Study in Speech Pathology (1-3).

*See Departmental Adviser for Approval of Electives prior to enrolling.

Field Experiences

The Laboratory Experiences Program provides sequential learning opportunities in public school and community settings for all students throughout the teacher preparation program. Laboratory experiences are provided primarily through the following programs: (1) **Field Experience Program**, (2) **Extended Laboratory Experiences** including a para-professional level program for secondary majors, (3) **Cooperative Education Program**, and (4) **the Professional Internship**.

The pre-teaching **Field Experience Program** provides an initial experience for all students as a prerequisite for admission to the Professional Teacher Education Program. Students are required to participate in the program in conjunction with Career Exploration and Planning (IED 101), or in Orientation for Transfer Students. This experience involves the students in planning and evaluating learning experiences, counselling, participating in pre-school conferences and faculty study, school and community meetings, and involvement in actual teaching situations.

The Extended Laboratory Experiences Program is conducted concurrently with enrollment in professional education courses which provide experiences in the schools and communities.

The Co-operative Education Program provides laboratory experiences for certain students involved in the teacher preparation program on an alternating quarter arrangement with college attendance. (For description see page 46).

The Professional Internship is a full-time assignment in an off-campus school and community. Experiences include personal and professional contacts with various phases of community life and the application of concepts, skills and knowledge the student has acquired in classroom situations.

The student enrolls for 15 credit hours and devotes a full quarter to the internship. No additional coursework, correspondence or regular, is permitted during the internship quarter. The program is divided into orientation, off-campus experience, and evaluation. Students must be admitted to the Teacher Education Program prior to the Professional Internship and must have completed appropriate courses in their areas of specialization.

The Internship for students with a major or minor in art, theatre, health, physical education and recreation, industrial arts, music, speech communication, and speech pathology, requires experience in both elementary and secondary schools.

Other laboratory experiences for students are provided within the framework of courses in the Teacher Education Program.

Dual Objectives Program

Students in other schools of the University who wish to complete requirements for graduation in an academic department and also to complete the degree requirements of the Teacher Education Program may pursue the dual objectives program.

A student electing to pursue the dual objectives program will have an adviser in the academic department in which he is enrolled and an adviser in the School of Education. Advising the student concerning the curriculum of the academic department, including the major, minor and other requirements, will be the responsibility of the adviser in that department. The responsibility for advising the student on matters concerning the Teacher Education Program will be that of the adviser in the School of Education. The quarterly course schedule of the student will be approved by both advisers. Information describing the dual objectives program is available in the Teacher Education Services Office of the School of Education in Haley Center and in the Office of the Dean of the School in which the student is enrolled.

Students enrolled in the School of Education who desire to complete certification requirements in more than one teaching field will complete the curriculum in each field: general studies, teaching specialization and professional teacher education (including the internship).

Applications and specific information about the criteria for selection and admission to Teacher Education are available in the Teacher Education Services Office in Haley Center, 3403.

Program Options, Non-Teaching

The following programs offered through the School of Education are education-related options which prepare students for service careers which do not require teacher certification.

Office Administration. A non-teaching program designed to prepare students to become professional secretaries, administrative assistants or to assume other responsible positions in business, government, or professional offices. This program does not require Admission to Teacher Education.

Office Administration Program

FRESHMAN YEAR			Third Quarter		
First Quarter			Second Quarter		
MH	Science	5	MH/SC	Eng. Comp.	5
EH 101	Eng. Comp.	3	EH 103	Eng. Comp.	3
HY/AT/EH	Eng. Comp.	3	HY/AT/EH	Typewriting I	3
PE 101	Fnd. of Phy. Ed.	1	VED 200	Group II course	1
VED 102K	Orient.	1	PE	Elective	3
SOPHOMORE YEAR					
EC 200	Economics	5	SY 201	Sociology	5
VED 201	Type II	3	VED 203	Type IV	3
SC 202	App. Sp. Comm.	3	EC 274	Statistics	5
ACF 211	Accounting	4		Elective	5
	Elective	3			
JUNIOR YEAR					
MN 207	Data Proc.	5	MT 331	Marketing	5
VED 305	Rec. Mgt.	3	VED 311	Shorthand II	5
VED 310	Shorthand I	5	MN 241	Business Law	4
MN 310	Prin/Mgt.	5	EH 315	BPW	3
				Elective	1
SENIOR YEAR					
VED 400	Transcription	5	VED 422	Sec. Proc. I	5
EHA 415	Report Writing	3	ACF 440	Personal Fin.	3
	Elective	5		Elective	5
	Elective	5		Elective	5

TOTAL—210 QUARTER HOURS

*Students may take any combination of World History, HY 101-102-103; Technology and Civilization, HY 204-205-206; History of Art, AT 171-172-173; and Western World Literature, EH 250-261-262.

Recreation Administration. This non-teaching program does not require admission to Teacher Education. However, the student must be screened prior to Internship (HPR 425C).

Major

General Studies

EH 101, 102, 103 English Composition	9
SC 202 Speech Communication	3
EH 253/260, 254/261, 255/262 Literature	9
BI 101 Principles of Biology	5
BI 102 Plant Biology/BI 104 Biology Human Affairs	5
Physical Science Electives (PHS, PS, CH, GL, AM, AY)	10
HY 101/204, 102/205, 103/206 World History/Technology and Civilization	9
SY 201 Introduction to Sociology	5
EC 200 Economics	5
PO 210 American State and Local Government	5
MH Mathematics Elective	5
PE PE Electives	5
Social Science Elective	5

Basic Core

HPR 282 Principles of Recreation	3
HPR 386 Recreation Leadership	3
HPR 387 Outdoor Recreation	3
HPR 388 Camp Management	3

HPR 486 Park Planning	3
HPR 494 Emergency Care and First Aid	3
ACF 211 Principles of Accounting I	4
RSY 362 Community Organization	5
MN 310 Principles of Management	4
MN 344 Environmental Law	4
MN 442 Personnel Management	4
JM 315 Technical Journalism	3
HPR 384 Park and Recreation Maintenance	3
HPR 423 C Recreation - Program & Administration	5
HPR 425 C Internship	15

Select Option A or B

A. HPR 118 Individual & Dual Activities I	3
HPR 119 Individual & Dual Activities II	3
HPR 120 Gymnastics	3
HPR 121, 351 Aquatics/Water Safety	2/3
HPR 122 Team Sports	3
HPR 123 Dance	4
CA 345 Creative Crafts	2
TH 315/307/308 Dramatics/Theatre	3
HPR 424 Intramurals & Officiating	3
HPR 485 Social Recreation	3
B. HPR 389 Recreation Interpretative Services	3
HPR 487 Park Management	3
ZY 206 Conservation in the U.S.	3
FY 460 Wildland Recreation	3
HF 221 Landscape Gardening	5
Approved Electives	15

Electives	VAR
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Total Required Hours	210
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Minor

HPR 282 Principles of Recreation	3
HPR 386 Recreation Leadership	3
HPR 387 Outdoor Recreation	3
HPR 388 Camp Management	3
HPR 494 Emergency Care and First Aid	3
Approved Electives	15

REHABILITATION SERVICES EDUCATION. This non-teaching program does not require completion of the Professional Education Core.

GENERAL EDUCATION 63 Hours Total

English	
EH 101-102-103 English Composition (3-3-3)	9
EH Literature (American-English-World)	9
SC 202 Applied Speech Communication	3

Social Science	
HY 101-102-103 World History (3-3-3) or	9
HY 204-205-206 Tech. and Civilization (3-3-3)	
PG 211 Intr. to Psychology	5

Natural Sciences	
BI 101 Principles of Biology	5
Approved Physical Sciences	10

Mathematics	
MH 140-College Algebra or MH 160-Pre-Calculus with Trigonometry	5

Physical Education	
PE Approved Physical Education (1-1-1)	3

Elective	5
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HUMAN SERVICES FOUNDATIONS 99 Hour Total

Educational	
IED 101 - or RSE 102R Career Explor. & Planning	1
EM 200 - Educational Media	2
FED 300 - Educational Psychology	5
CEJ 322 - Human Relations in Education	2
FED 400 - Evaluation in Education	5

Psychological	
PG 433 - Personality	4
PG 435 - Behavior Pathology or FED 534	4(5)
Personality Dynamics and Effective Behavior	
Psychology Elective	5

Sociological

SY 201 - Intr. Sociology	5
Sociology Elective or FED 350 (Sociological Option)	5
CED 523 - Community Resources Rehabilitation	3

Biological/Medical

ZY 250 - Human Anatomy	5
ZY 251 - Physiology	5
CED 523 - Medical and Adv. Aspects of Rehab.	4

Vocational

EC 206 - Socio-Economic Foundation of Cont. America	3
RSE 535 - Intro. Vocational Evaluation	5
RSE 537 - Occ. Orientation of Develop. Disabled	5
RSE 538 - Work Adjustment in Rehabilitation	5

Exceptionality

RSE 330 - Careers in Rehabilitation	5
RSE 376 - Exceptionality	5
RSE 414 - Assessment Methods in Rehabilitation	3
RSE 415 - Teaching and Behavior Change Strategies in Rehabilitation	3
RSE 495R - Practicum in Rehabilitation	5
CED 522 - Intro. Counseling the Exceptional	4

REHABILITATION SPECIALTY LEVEL**48 Hour Total**

RSE 446R - Independent Study-Rehabilitation	3
RSE 495R - Practicum in Rehabilitation	5
RSE 425R - Internship in Rehabilitation	15
Approved Program in Area of Specialty	25

Total **210 Hours**

Graduate Programs

Graduate programs are offered through the Graduate School in administration and supervision; counselor education; educational media; elementary education; health education; physical education; rehabilitation services; secondary education; special education; and vocational and adult education.

Fifth and sixth-year programs of study in the above areas lead to the degrees of Master of Science, Master of Education, and Specialist in Education. Nondegree graduate study is also available through the Diploma Program leading to sixth-year certification.

The Doctor of Education is offered in Educational Leadership, Counselor Education, Elementary Education, Secondary Education, and Vocational and Adult Education. Specializations in Secondary Education include the following sub-specializations: (a) English Education, (b) Mathematics Education, (c) Science Education, and (d) Social Science Education. See *Graduate School Bulletin*.

The Master of Education, Master of Science in Education, Specialist in Education and Doctor of Education are offered for junior college administrators, student personnel administrators, and teachers. These programs meet requirements of the Southern Association of Colleges and Schools, the Graduate School, and the School of Education. Sufficient flexibility exists to permit students to adapt programs to their individual needs.

Related Programs and Services

Teacher Certification Services

Programs in the School of Education are approved by the National Council for Accreditation of Teacher Education (NCATE), the National Association of State Directors of Teacher Education and Certification (NASDTEC), the Interstate Reciprocity

Compact (IRC) and the Alabama State Board of Education for certifying superintendents, supervisors, principals, counselors, elementary and secondary teachers, and educational media specialists. Upon satisfactory completion of a prescribed course of study and upon recommendation of the Dean of the School of Education a professional certificate will be issued by the appropriate State Department of Education. Twenty-eight State Departments of Education now have reciprocal agreements for issuing certificates to graduates of institutions accredited by NCATE.

Students in schools other than the School of Education who wish to complete requirements for graduation in an academic department and also to complete the degree requirements of the Teacher Education Program may pursue the dual objectives program. (See page 136.) Students may also take courses in education and psychology for acquiring knowledge and understanding of human growth and development, and teaching as a profession. They are eligible to take all such courses for which they satisfy prerequisites.

In-Service Agricultural Education and Supervision

J. C. HOLLIS, *State Supervisor*

Assistant Supervisors HOLLEY, HALCOMB, LEWIS, AND WHITE

In cooperation with the State Department of Education, the School of Education maintains an in-service teacher education and supervisory division. This service extends to 400 departments of vocational agriculture in accredited high schools of the State.

Vocational Rehabilitation Service

HOWARD, HUDSON, and PATTERSON, *Counselors*

The State Department of Education in cooperation with Auburn University maintains the local Rehabilitation Service which provides vocational guidance, counseling, training, and placement services to handicapped citizens. The Rehabilitation Service also makes available to handicapped citizens such services as: surgical and/or medical care, hospitalization, therapeutic treatment, and artificial appliances, when these services are essential to training and/or employment and the individual is not financially able to secure them.

Learning Resources Center

The Learning Resources Center (LRC) located in Haley Center is a service component for the School of Education and the School of Arts and Sciences. The LRC provides media services which include filmstrips, transparencies, disc recordings, tape recordings, kits, educational games, and programs of instruction. LRC personnel assist the faculty and students with the production, selection, and utilization of learning materials.

School of Engineering

CHESTER C. CARROLL, *Dean*
EDWARD O. JONES, *Assistant Dean*
FRED J. MOLZ, *Assistant Dean*

ENGINEERS in the Eighties are faced with world-wide problems and expectations awesome in responsibility yet exciting as professional challenges. These range from the extremes of interplanetary exploration through earth orbiting systems to the problems arising mainly from our population explosion: energy, better productivity, housing, transportation, and pollution control.

As a renewed appreciation develops for the contribution of science and technology, engineering leaders are calling for greater numbers of engineers equipped to tackle the specific, technical problems of the future. Significantly, they also are calling for engineers who by breadth of education and understanding of other disciplines can convince others of the role of engineers not only in technical matters but in policy decisions to insure the use of technology to benefit mankind. We hope, therefore, we are entering an era in which science and technology will receive a more objective assessment.

Engineering education at Auburn provides in a four-year period both the technical knowledge and the broad general education necessary to equip engineers for their problem-solving challenges. Centered around mathematics and the physical sciences, the curricula also stress the importance of social sciences, humanities, and communication skills. Auburn's engineering programs enable individuals to develop their natural talents and to provide knowledge, skills, and understanding that will encourage them to find their places in society as well as in their vocations.

Admission

Freshmen eligibility is determined by the Admissions Office. However, since the requirements for engineering education necessitate high school preparatory work of high intellectual quality and of considerable breadth, the following program is recommended as *minimum* preparation: English, four units; mathematics (including algebra, geometry, trigonometry, and analytical geometry), four units; chemistry, one unit; history, literature, social science, two or three units. Physics and foreign languages are recommended but not required.

Transfers from Other Institutions must apply through the Admissions Office for admission to curricula in the School of Engineering. (See University regulations, p. 17.) The exact placement of these students can be determined only upon review of their transcripts by the Director of Professional Programs of the School of Engineering. Students will then be placed in the curriculum of their choice if they have completed the requirements listed under the section on Pre-Engineering below. Otherwise, assignment will be to the appropriate Pre-Engineering curriculum.

Students transferring from junior colleges are allowed credit for equivalent courses taken at the junior colleges, subject to a maximum equal to the number of hours printed in the first two years of their curriculum. The acceptable courses are not, however, limited to the listings within the first two years.

Many courses required by the School of Engineering are highly specialized in their content and potential transfer students need to select courses with care. Therefore, to insure maximum transferability of credits, students are encouraged to contact the School as soon as possible about acceptable credits. Write to the Director of Professional Programs, School of Engineering.

Transfers from On-Campus must be approved by the School of Engineering. The requirements for such transfers are the same as for students coming from other institutions. (See University regulations, page 17.)

Programs

Undergraduate

Pre-Engineering—The Pre-Engineering Program consists of a freshman program of studies to prepare students for curricula in the School of Engineering. It also provides academic and career counseling to assist students in determining the curriculum that best fulfills their personal and educational objectives.

Professional Engineering—Curricula accredited by the national accrediting agency, the Accreditation Board for Engineering and Technology (formerly the Engineers' Council for Professional Development), lead to the degrees of Bachelor of Aerospace Engineering, Chemical Engineering, Civil Engineering, Electrical Engineering, Industrial Engineering, Materials Engineering, Mechanical Engineering and Bachelor of Science in Agricultural Engineering.

These curricula are designed to meet the educational requirements of the engineering professions. The program in the fundamental sciences of mathematics, chemistry, and physics is followed by a study of basic engineering sciences. Specialized or departmental courses are taken in the third and fourth years with humanistic-social studies interspersed throughout the four years. Flexibility is provided in all degree programs through electives so that the individual student may emphasize areas of personal interest.

Others—The Bachelor of Aviation Management degree (administered by the Aerospace Engineering Department) provides education for management careers with the airlines, general aviation, airports, and other industries.

The Textile Engineering Department administers curricula leading to the degrees of Bachelor of Textile Engineering, Textile Chemistry, and Textile Management and Technology. These programs are designed to prepare one for a career in one of the many facets of the textile industry.

Two interdepartmental curricula in Computer Science and Engineering are available: Bachelor of Science in Computer Science and Bachelor of Computer Engineering.

The Bachelor of Science in Forest Engineering is offered jointly by the Agricultural Engineering Department and the Forestry Department, both in the School of Agriculture. The curriculum combines professional courses in engineering and forestry for students who want careers in forest industries that require training in both engineering and forestry.

Dual-Degree—The School of Engineering has completed agreements with several predominantly liberal arts institutions to offer a three-two program which results in two college degrees. The broad background provided by this program enables the student to cope more effectively with many of the problems of modern-day society.

The first three years would be devoted to earning a major in any one of the disciplines offered by that college while completing the basic sciences and mathematics required for pre-engineering. Upon completion of three years at the "first college" the student transfers to the School of Engineering and, after approximately two years study in an engineering curriculum, receives a baccalaureate degree from the "first college" and an Engineering baccalaureate degree from Auburn.

Dual degree agreements have also been completed between the School of Engineering and the Auburn University Schools of Agriculture, Arts and Sciences, and Business.

For additional information concerning the Dual Degree Program, contact the Dean of Engineering.

Graduate—Master of Science degrees are offered in Aerospace Engineering, Agricultural Engineering, Chemical Engineering, Civil Engineering, Electrical Engineering, Industrial Engineering, and Mechanical Engineering. In addition, there are two professional degrees, Master of Industrial Engineering and Master of Mechanical Engineering. The Doctor of Philosophy degree is offered in Aerospace Engineering, Agricultural Engineering, Chemical Engineering, Civil Engineering, Electrical Engineering, Industrial Engineering, and Mechanical Engineering. For requirements for these degrees, see the *Graduate School Bulletin*.

Humanistic-Social Studies Requirements

In addition to being specialists in their own fields, engineers must also be acquainted with the humanities, be aware of the social implications of their activities, and be equipped to assume responsibilities in these areas. To assist them in this preparation, degree requirements include approximately 20 quarter-credit hours of humanistic-social studies in addition to the specified courses in English Composition and History. The University requires at least one course from the area of Humanities and one course from the area of Social Sciences. The courses are either prescribed, elective, or a combination, depending upon the specific engineering curriculum. Lists of approved electives are available in 104 Ramsay Hall.

Degree Requirements—To earn a bachelor's degree from the School of Engineering, a student must complete in his curriculum and must have a cumulative average of at least 2.00 on all work attempted at Auburn University.

Additional Information

Military Training—All curricula in the School of Engineering permit the use of some basic and advanced ROTC. For these options, see the specific curriculum.

Service Department—The Technical Services Department offers courses in graphical methods, industrial laboratories, manufacturing processes, etc. The courses offered in this department may also be taken by students in other schools who may find them useful in their particular fields. The Department, in cooperation with the School of Education, offers a program for the professional and technical training of Industrial Arts and Vocational teachers for elementary and secondary schools. (See School of Education for major and minor requirements.)

Cooperative Education—The Cooperative Education Program is offered in all curricula of the School of Engineering. Refer to page 46 for a brief description of the program and write to the Director, Cooperative Education, Auburn University, Alabama 36849, for a booklet which gives additional information.

Extension—The Engineering Extension Service helps to extend the resources of the School of Engineering to the people, businesses, and industries of the state. Most of the programs of this expanding service are short courses, conferences, workshops, and seminars. For further information, write to the Associate Director, Engineering Extension Service, 107 Ramsay Hall.

Pre-Engineering

Scholastic Requirements—Pre-Engineering students are transferred to the curriculum of their choice in the School of Engineering upon meeting the following requirements:

1. Complete all appropriate freshman courses;
2. Earn an overall grade point average of 2.2 (except in Textile Management and Technology, which requires a minimum of 2.0) on all required and approved elective course work.

A student who has not proceeded from Pre-Engineering to his field of major interest in the School of Engineering after six resident quarters may continue to register in Pre-Engineering only by special permission of the Dean of Engineering. Junior standing will not be granted to any student in the Pre-Engineering Program.

Curricula Designations are as follows: PNM for Aviation Management; PTN for Textile Engineering, Textile Chemistry and Textile Management and Technology; PCN for Chemical Engineering; and PN for all other curricula.

The Pre-Engineering curriculum shown below is uniform for Aerospace, Civil, Electrical, Industrial, Materials, and Mechanical Engineering. Therefore, a student is not required to designate a curriculum choice prior to the completion of the Pre-Engineering curriculum.

The curricula of Aviation Management, Chemical Engineering, Computer Science, Computer Engineering, Textile Chemistry, Textile Engineering, and Textile Management and Technology have separate freshman year requirements.

Pre-Engineering Curriculum (PN)

FRESHMAN YEAR											
First Quarter				Second Quarter				Third Quarter			
MH 161	An. Geom. & Cal.*	.....5		MH 162	An. Geom. & Cal.	.....5		MH 163	An. Geom. & Cal.	.....5	
CH 103	Fund. Chem. I.**	.....4		CH 104	Fund. Chem. II	.....4		PS 220	Gen. Physics I	.....4	
CH 103L	Gen. Chem. Lab.	.....1		CH 104L	Gen. Chem. Lab.	.....1		EH 103	English Comp.	.....3	
EH 101	English Comp.	.....3		EH 102	English Comp.	.....3		HY	History†	.....3	
HY	History†	.....3		HY	History†	.....3		TS 102	Graph. Comm. & Des.	.....2	
	Free Elective	.....1			Free Elective	.....1			Physical Education††	.....1	
	Physical Education††	.....1			Physical Education††	.....1					

*Students not prepared for Mathematics 161 are enrolled in Mathematics 160.

**Students not qualified to take CH 103 will take CH 101 followed by CH 102 with 103L in their second quarter and CH 104 and 104L in their third quarter.

†See History Requirements, page 13.

††Must be taken on "pass-fail" basis. Basic ROTC may be substituted.

Department of Aerospace Engineering

The Aerospace Engineering curriculum provides a background for students entering many areas of today's scientific and technological fields. The first two years of study are devoted to the basic subjects of mathematics, physics, and mechanics. The last two years deal with such areas as aerodynamics, design, astrodynamics, propulsion, structures, and flight dynamics. In support of these areas, courses in advanced mathematics, computer programming (both digital and analog), and systems analysis are offered. The methods of systematic problem analysis are stressed. The theory taught in classroom lectures is experimentally verified in laboratory sessions. During the senior year students may take technical electives in several fields of specialization. The Aerospace Engineering Curriculum also serves as a background for graduate study and research.

Curriculum in Aerospace Engineering (AE)

FRESHMAN YEAR

(See Pre-Engineering Curriculum)

SOPHOMORE YEAR

First Quarter

MH 264	An. Geom. & Cal.	5
ME 205	Applied Mech. Statics	4
PS 221	Gen. Physics II	4
AE 203	Aerospace Fund. Basic ROTC or Elect.	1

Second Quarter

ME 321	Dynamics I	4
PS 222	General Physics III	4
MH 265	Diff. Equations	3
	Basic ROTC or Elect.	1
	Hum.-Soc. Elect.*	5

Third Quarter

ME 301	Thermodynamics I	4
AE 300	Aerosp. Analysis I	3
EE 261	Linear Circuit Analysis I	3
ME 207	Strength of Matls. I	3
	Hum.-Soc. Elect.*	3
	Basic ROTC or Elect.	1

JUNIOR YEAR

AE 307	Aerosp. Structures I	5
AE 310	Aerosp. Analysis II	4
AE 330	Aero. Instrumtn.	3
ME 340	Fluid Mechanics I	3
	Hum.-Soc. Elect.*	3

AE 302	Airloads	4
AE 303	Theo. Aerodynam.	4
AE 326	Fund. of Aerospace Dynamics	3
AE 311	Aerosp. Materials & Methods of Constructn.	2
EH 304	Tech. Writing I	3

AE 409	Aerosp. Structures II	5
AE 515	Jet Propulsion	5
AE 304	Theor. Aerodynam. II	4
PS 320	Modern Physics	3

SENIOR YEAR

AE 439	Static Stability & Control	4
AE 534	Aero. Systems Anal.	3
AE 305	Flight Performance	3
AE 401	Aerosp. Problems I	1
	Tech. Elective†	3
	Hum.-Soc. Elect.*	3

AE 500	Viscous Aero.	4
AE 532	Astrodynamics I	3
AE 541	Dyn. Stab. & Control	3
AE 448	Aero. Design I	1
	Tech. Elective	6

AE 529	Aircraft Vibration and Flutter	4
AE 533	Astrodynamics II	3
AE 449	Aero. Design II	2
	Technical Elective	6
	Hum.-Soc. Elect.*	3

TOTAL—208 QUARTER HOURS

*See section on Humanistic-Social Electives.

†Advanced ROTC may be substituted for EH 304 and 3 hours of Technical Electives.

SUGGESTED TECHNICAL ELECTIVES

In addition to the subjects listed below, other subjects may be used as technical electives upon approval of the Head of the Department.

AE 427	Engineering Meteorology	3	EE 264	Linear Circuit Analysis II Laboratory	1
AE 491	Special Problems	1-5	EE 371	Electronics	3
AE 501	Adv. Three-dimensional Aerodynamics	3-5	IE 410	Probability & Statistics	5
AE 514	Equilibrium Gas Dynamics	3	ME 303	Thermodynamics III	3
AE 516	Rocket Propulsion I	3	ME 501	Statistical Thermodynamics	3
AE 517	Rocket Propulsion II	3	ME 521	Heat Transfer	4
AE 520	Dynamic Simulation	3	ME 522	Transport Phenomena	3
AE 521	Flight Vehicle Stress Analysis	3	ME 543	Photoelastic Stress and Strain Analysis	3
AE 524	Nonequilibrium Gas Dynamics	3	MH 503	Engineering Mathematics II	5
AE 528	Space Propulsion Systems	5	MH 506	Elementary Partial Diff. Equations	5
AE 535	Elements of V/STOL Flight	3	MH 560	Introduction to Numerical Analysis	5
AE 536	Rotary Wing Aerodynamics	3	MH 561	Numerical Matrix Analysis	5
AE 542	Automatic Stability and Control	3	MH 567	Mathematical Statistics I	5
AE 543	Flight Simulation	3	PS 505	Nuclear Physics	5
AE 545	Missile Aerodynamics	3			
CHE 540	Nuclear Engineering	5			
EE 263	Linear Circuit Analysis II	4			

Aviation Management

The curriculum in Aviation Management provides education for management careers with the airlines, general aviation, manufacturing, governmental agencies or the military services. The study of fundamental aerospace courses is combined with specified subjects in industrial engineering, business management and selected electives to provide preparation for the various specific functions of the aerospace industries including general management, production, operations, flying, maintenance, and education and training. Laboratory experience in aviation management and flight is provided through the university-owned and operated airport in which students are given the opportunity to participate in administration, training and aircraft maintenance and servicing. The Aviation Management curriculum also provides a broad educational

background of fundamental philosophies, theories, and concepts needed for research and study at the graduate levels.

Curriculum in Aviation Management (AM)

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
MH 160	Pre-Cal. with Trig.	5	MH 161	An. Geom. & Cal.	5	AM 200	Aero. Problem Anal.	5
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
HY 204	Tech. & Civ. I	3	HY 205	Tech. & Civ. II	3	HY 206	Tech. & Civ. III	3
TS 100	Intr. to Mfg. Proc.	2	TS 107	Graphic Analysis	2	TS 108	Design for Mgt.	2
TS 102	Graphic Communic.	2		& Design	2	PE 202	Aerosp. History	3
PE	Physical Education*	1	PE	Basic Shop Elective	1		Physical Education*	1
				Physical Education*	1			

SOPHOMORE YEAR

AM 201	Elem. Aeronautics	5	AE 203	Aerospace Fund.	3	MN 274	Business Statistics	5
EC 200	Economics I	5	PG 211	Psychology I	5	PO 209	Intr. to Amer. Govt.	5
PS 205	Intr. Physics	5	PS 206	Intr. Physics	5	AM 314	Aerosp. Mgt. & Operatnl Problems	3
	General Elective	3		General Elective	3	IE 201	Industrial Admin.	3

JUNIOR YEAR

MT 241	Business Law I	4	AM 312	Guidance & Control Fundamentals	5	AM 305	Aviatn. Meteorology	5
ACF 215	Gen. & Cost Acctg.	5	IE 320	Engr. Economy	5	AM 313	Aerosp. Vehcl. Syst.	5
SC 211	Public Speaking	5	IE 310	Motion & Time Study	5	MT 372	Economics of Transp.	5
AM 309	Reciprctng. Engines & Propulsion Prin.	3	AM 310	Jet Propulsion	3	EHA 304	Technical Writing	3

SENIOR YEAR

IE 302	Production Control	3	AM 417	Airline Operations	5	MN 442	Personnel Mgt.	4
AM 407	Air Transportation	5	AM 409	Aerosp. Legislation	3	AM 401	Aerospace Seminar	1
PG 561	Industrl. Psychology	5	AM 413	Airport Mgt.	3		AM Elective	5
AM 403	Gen. Aviatn. Mgt.	3		AM Elective	3		Technical Elective	8
	Technical Elective	3		Technical Elective	5			

TOTAL—207 QUARTER HOURS

Twelve hours of ROTC (Basic 6; Advanced, 8) may be substituted for 6 hours of General Electives, SC 211 (five hours) and 1 hour of technical electives.

Basic Shop electives may include TS 112, 113, 114, 115, or 216. If TS 216 is used, the additional hour may be used as a Technical Elective.

*Must be taken on "pass-fail" basis.

Option in Professional Flight

The Professional Flight Option (PFO) is not a separate curriculum but an option within the basic Aviation Management program. The PFO develops competency in flight to prepare the student for a professional career in flight operations to include such positions as a flight officer with the airlines, a corporate pilot, or a flight instructor. Aviation Management students may be accepted in the PFO by meeting the qualifications set forth in the Professional Flight Option Policies and Procedures statement which can be obtained from the Aviation Management Program Coordinator. The following courses are required in the PFO as a minimum:

AM 321	Commercial Flight Problems	3
AM 322	Commercial Flight Training I*	1
AM 323	Aircraft Operations and Performance	3
AM 324	Commercial Flight Training II*	1
AM 325	Principles of Instrument Flight	3
AM 326	Commercial Flight Training III*	1
AM 327	Commercial Flight Training IV*	1
AM 404	General Aviation Operations	3
AM 427	Multi-Engine Flight Training I*	3
AM 428	Principles of Flight Instruction	3
AM 429	Flight Instructor Training*	1
AM 431	Multi-Engine Flight Training II*	3
AM 432	Principles of Professional Flight	3
AM 433	Transport Aircraft Flight Training*	3

Normally AM 428 Principles of Flight Instruction (3 hrs.) and AM 429 Flight Instructor Training (1 hr.) are required for the PFO. However, AM 427 and AM 431, Multi-Engine Training I and II (4 hrs.) may be substituted.

If the PFO is selected, the following course in the basic AM curriculum is not required and cannot be used as an elective:

AM 312 Guidance and Control Fundamentals

*A separate flight instruction fee is applicable to this course.

Department of Agricultural Engineering

The Agricultural Engineering curriculum is designed to provide the graduate with engineering skills necessary to serve the nation's largest industry—agriculture. In addition to a strong background in mathematics, physical sciences, and basic engineering fundamentals, the student of agricultural engineering receives training in biological and agricultural sciences. Through technical electives in the senior year, one can specialize in one or more areas to include soil and water conservation, power and machinery design, electric power and processing, agricultural structures and environment, food engineering, forest engineering, and waste management and agricultural pollution control.

The curriculum is coordinated by the School of Engineering and the School of Agriculture. Students register in the School of Agriculture. A student in the pre-engineering program can transfer without loss of credit.

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
MH 161	An. Geom. & Cal.	5	MH 162	An. Geom. & Cal.	5	MH 163	An. Geom. & Cal.	5
BI 101	Prin. of Biology	5	CH 103	Gen. Chem		CH 104	Gen. Chem	
AN 101	Intr. to Ag. Eng.	2		& Lab.	5		& Lab.	5
TS 102	Graph. Communi-		EH 101	English Comp.	3	EH 102	English Comp.	3
	cation & Design	2	AN 102	Ag. Engr. Prin.	2	PE	From Group II†	1
PE 101	Fnds. of Phys. Ed.	1	PE 102	Begin. Swim†	1		Basic ROTC†	1
	Basic ROTC†	1		Basic ROTC†	1			

SOPHOMORE YEAR

MH 264	An. Geom. & Cal.	5	PS 221	Gen. Physics II.	4	ME 202	Engr. Matls. Science	3
BI 102	Plant Biology	5	ME 207	Strength of Matls. or		CHE 331	Engr. Thermodyn	3
PS 220	Gen. Physics I	4	CE 207	Mech. of Solids	3		or	
ME 205	Appl. Mech. Statics or		MH 265	Diff. Equations	3	ME 301	Thermodynamics I	4
CE 205	Eng. Mech. Statics	4	EH 103	English Comp.	3	ME 321	Dynamics I	4
	Basic ROTC†	1	BY 103	Animal Biology	5	PS 222	Gen. Physics II	4
				Basic ROTC†	1	IE 204	Computer Program	3
							Basic ROTC†	1

JUNIOR YEAR

EE 261	Circuit Analysis I	3	AEC 202	Ag. Econ. I	5	MH	Math Elective	3
AN 301	Mechanics of Farm		EE 263	Circuit Anal. II	4	AN 306	Elec. Systems	3
	Machines	3	AN 302	Mechanics of		AN 304	Drain. & Irrigation	3
AN 307	Structures Des. I	3		Tractor Power	3		Ag. Engr. Elective	3
CE 308	Hydraulics	5	AN 305	Agric. Proc. Eng.	3		Elec. Engr. Elective	3
	or			History Elective	3		History Elective*	3
ME 340	Fluid Mechanics	3						
	History Elective*	4						
	Engr. Electives	4						

SENIOR YEAR

AN 303	Soil & Water Engr. I	3	Hum.-Soc. Elective	5	Hum.-Soc. Elective	7
AN 303L	Soil & Water Engr. Lab I		Ag. Elective	5	Ag. Elective	5
AY 307	Gen. Soils	5	Ag. Engr. Elective	3	Engr. Elective	3
SC 202	App. Sp. Comm	3	Engr. Elective	3		
	Engr. Electives	7				

TOTAL—210 QUARTER HOURS

†Students may choose six hours of electives in lieu of Basic ROTC and a three-hour elective in lieu of PE in consultation with their academic advisers.

SC 202 will be waived for students who complete a year of Advanced ROTC.

A list of the recommended electives is available in the offices of the adviser and Dean and must be approved by them.

*Students may choose Technology and Civilization HY 204, 205, 206 or World History 101, 102, 103.

Department of Chemical Engineering

The program leading to the bachelor's degree in chemical engineering consists almost entirely of the study of broad scientific and engineering principles which have numerous applications in the chemical and related industries. The student may select a major interest area during the junior year. These include process engineering, nuclear engineering, biochemical engineering, environmental engineering, biomedical engineering, engineering science, and production management. Technical electives may be selected in all of these and other areas on an individual basis. Those students who elect to continue their education through one or more advanced degrees are qualified for better positions and often make more rapid progress than those with only the bachelor's degree.

The broad university training provided, when supplemented by professional experience, enables graduates to qualify for positions as engineers in production, research and development, sales engineering, plant design and management. The biomedical engineering option provides an excellent background for students planning to enter medical school.

Curriculum in Chemical Engineering (CHE)

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
CH 111	Gen. Chemistry	5	CH 112	Gen. Chemistry	5	CH 113	Gen. Chemistry	5
MH 161	An. Geom. & Cal.	5	MH 162	An. Geom. & Cal.	5	MH 163	An. Geom. & Cal.	5
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
TS 102	Graphic Communic.	2	HY	History**	3	HY	History**	3
PE	Physical Education††	1	PE	Physical Education††	1	PE	Physical Education††	1

SOPHOMORE YEAR

MH 264	An. Geom. & Cal.	5	CH 303	Organic Chemistry	5	CH 304	Organic Chemistry	5
PS 220	Gen. Physics I	4	PS 221	Gen. Physics II	4	PS 222	Gen. Physics III	4
HY	History**	3	ME 205	Engr. Mech. Statics	4	ME 207	Mechanics of Solids	3
	Hum.-Soc. Elect***	5	MH 265	Diff. Equations	3		Hum.-Soc. Elect***	5
			CHE 213	Digit Comp. in CHE	3			

JUNIOR YEAR

CH 507	Physical Chemistry	5	CH 508	Physical Chemistry	5	CHE 313	CHE Analysis	4
EE 300	Fund. Elec. Eng.	5	CHE 332	Thermodynamics I	4	CHE 353	Heat Transfer	4
CHE 321	Chem. Proc. Pnn.	4	CHE 352	Fluid Mechanics	4	CHE 343	Stagewise Processes	4
CHE 331	Engr. Thermodyn.	3		Tech. Elective***	3		Hum.-Soc. Elect***	5
				Hum.-Soc. Elect***	3			

SENIOR YEAR

CHE 470	Seminar	1	CHE 511	Process Dynamics & Control	4	CHE 512	Proc. Control Lab.	1
CHE 521	Thermodynamics II	4		CHE Design I	4	CHE 543	CHE Design II	3
CHE 551	Mass Transfer	4	CHE 542	CHE Design I	4		Tech. Elective***	12
CHE 582	CHE Lab.	6	CHE 522	Chem. React. Eng.	4		Hum.-Soc. Elect.***	2
	Tech. Elective***	3		Tech. Elective***	6			

TOTAL—210 QUARTER HOURS

*CH 103, 103L and 104, 104L are acceptable substitutes for CH 111 and 112 for students transferring into CHE.

**See History requirements, page 13.

***See section on Humanistic-Social Electives. Basic ROTC may be substituted for three hours of Humanistic-Social Electives. Three hours of Advanced ROTC may be substituted for three hours of Technical Electives.

****Technical electives shown above total 24 hours. They may be taken in one of the following seven areas. Typical courses in each area from which the 24 hours may be selected with the consent of faculty adviser are listed below.

†Students not prepared for MH 161 must take MH 160 without credit.

††Must be taken on "pass-fail" basis. Basic ROTC may be substituted.

TECHNICAL ELECTIVES

Biochemical Engineering		Environmental Engineering		Engineering Science	
BY 300	General Microbiology...5	BY 300	General Microbiology...5	CHE 450	Special Topics...TBA
BY 504	Intr. to Industrial Microbiology...3	BY 403	Pesticides...5	CH 305	Organic Chemistry...3
BY 540	Microbial Physiology...3	BY 541	Sanitary Microbiol...5	CH 509	Physical Chemistry...5
CH 518	Biochemistry...5	CHE 450	Special Topics...TBA	CH 510	Intermd. Inorg. Chem...5
CH 519	Biochem (Metabls)...5	CHE 565	Industrial Waste Water Treatment...4	CH 513	Analytical Chemistry...5
CHE 450	Special Topics...TBA	CHE 585	Air Quality Engr...4	CH 515	Polymer Technlgy I...4
CHE 595	Biochemical Engr...3	CE 305	Water Supply & Disposal Systems...5	CH 516	Polymer Technlgy II...3
FS 340	Industrial Food Preservation Tech...5	CE 405	Water & Waste Water Treatment...5	CH 519	Biochemistry...5
FS 514	Food Microbiology...5	CE 408	Envir. Engr. Design...5	CH 519	Biochem (metabls)...5
IE 410	Engr. Statistics...5	CE 509	Envir. Health Engr...3	IE 410	Engr. Statistics...5
PS 517	Intr. to Biophysics...5	CE 520	Sanitary Engr. Lab...5	IE 411	Operatns Research...5
		CE 524	Air Pollution...5	ME 501	Statistical Thermodyn...5
Biomedical Engineering		FS 514	Food Microbiology...5	MH 266	Topics in Linear Alg...3
BY 300	General Microbiology...5	FS 515	Food Plant Sanitatin...3	MH 331	Intr. Modrn. Alg. I...5
BY 302	Medical Microbiology...5	IE 410	Engr. Statistics...5	MH 332	Intr. Modrn. Alg. II...5
BY 446	Clinical Microbiology...5	IE 438	Occupnl. Safety...5	MH 362	Engr. Math I...3
BY 540	Microbial Taxonomy...3	MT 344	Environmental Law...4	MH 501	Calc. of Vectr. Functns...3
BY 542	General Virology...5	PS 570	Health Physics...5	MH 503	Engr. Math II...5
CHE 450	Special Topics...TBA	PY 537	Fund of Bionuclncs...3	MH 505	Matrix Theory & Appl...5
CHE 595	Biochemical Engr...3	ZY 306	Prin. of Ecology...5	MH 506	Elem. Partl. Diff. Equatn...3
CH 305	Organic Chemistry...5	ZY 435	Gen. Oceanography...3	MH 508	Elemnts. Numerical Anal...5
CH 513	Analytical Chem...5	ZY 536	Biological Oceanogrp...5	MH 510	Calculus of Variatns I...3
CH 518	Biochemistry...5	Production Management		MH 511	Calc. of Variatns II...3
CH 519	Biochem (Metabls)...5	ACF 211	Prin. of Acctng. I...4	MH 515	Algebra for Appl. Math...5
EE 371	Electronics I...3	ACF 212	Prin. of Acctng. II...4	MH 518	Anal. for Appl. Math...5
EE 549	Electrical Methods in Biomedical Engr...3	ACF 213	Mgt. Cost & Budgtng...4	MH 524	Fourier Analysis...5
PS 517	Intr. to Biophysics...5	ACF 361	Prin. of Bus. Finance...5	MH 528	Linear Diff. Syst. I...3
ZY 250	Human Anatomy...5	ACF 363	Advncd. Bus. Finance...5	MH 529	Lin. Diffrentl. Syst. II...3
ZY 300	Genetics	CHE 450	Special Topics...TBA	MH 537	Linear Algebra...5
ZY 302	Vertebrate Embryology...5	IE 201	Industrial Admin...3	MH 560	Intr. Numerical Anal...5
ZY 310	Cell Biology...5	IE 302	Prod. Contrl. Technq...3	MH 561	Numer. Matrix Anal...5
ZY 560	Mammal Physiology I...5	IE 402	System Analysis for Occupnl. Safety...3	MH 575	Graph Theory...5
ZY 561	Mammal Physiology II...5	IE 410	Engr. Statistics...5	PS 305	Modern Physics...5
Process Engineering		IE 411	Operatns Research...5	PS 514	Electron Microscopy...5
AN 355	Prin. Food Engr. Tech...5	IE 566	Indust. Mntnce Engr...3	PS 535	Intr. Solid State Phys...5
CHE 450	Special Topics...TBA	MH 266	Topics in Linear Alg...3	Nuclear Engineering	
CHE 540	Nuclear Engineering...5	MN 310	Prin. of Management...3	CHE 450	Special Topics...TBA
CHE 560	Intr. to Plastics...5	MN 346	Organztn. Behavior...4	CHE 540	Nuclear Engineering...5
CHE 595	Biochemical Engr...3	MN 380	Prin. of Oprtn. Mgt...3	CE 428	Radiologcl. Health Engr...3
CH 305	Organic Chemistry...5	MN 381	Mgt. Decision Making...5	EE 301	Engr. Instrumntatn...3
CH 509	Physical Chemistry...5	MN 385	Prodctn. Management...5	EE 371	Electronics I...3
CH 510	Intermd. Inorg. Chem...5	MN 420	Appld. Business. Mgt...5	EE 385	Power Systm. Anal...4
CH 513	Analytical Chemistry...5	MT 241	Business Law I...4	EE 481	Electromechanical Energy Conversion...5
CH 515	Polymer Technlgy...4	MT 242	Business Law II...4	ME 510	Power Plant Systms...5
EE 301	Engr. Instrumntatn...3	MT 255	Legal & Social Envir. of Business...4	ME 514	Turbomachines...4
EE 371	Electronics I...3	MT 344	Environmental Law...4	PS 305	Modern Physics...5
FS 201	Intr. Food Sci. & Tech...5			PS 505	Nuclear Physics...5
FS 514	Food Microbiology...3			PS 509	Intr. Reactor Physics...5
IE 410	Engr. Statistics...5			PS 525	Prin of Nuclear Energy Systems...5
IE 438	Occupnl. Safety...5			PS 545	Plasma Physics...5
ME 304	Engr. Matls. Science: Properties...3			PS 570	Health Physics...5
ME 335	EMS. Phys. Metallurgy...4			PY 537	Fund of Bionuclncs...3
ME 536	EMS: Ferrous Metlrgy...3				

Department of Civil Engineering

The Civil Engineering curriculum provides a background in mathematics and the physical sciences, in humanistic-social studies, and in the engineering sciences and the interrelated subdisciplines of civil engineering. Technical electives including design electives permit the undergraduate limited specialization in an area of civil engineering such as construction, environmental engineering, soils, structures, transportation, or water resources.

The civil engineer plays an essential role in the realization of some of the most basic goals, objectives, and needs of society. These relate to man's need for shelter, mobility, water, air, and productive land—the environment in which he lives and works.

Curriculum in Civil Engineering (CE)

FRESHMAN YEAR

(See Pre-Engineering Curriculum)

SOPHOMORE YEAR

First Quarter		Second Quarter		Third Quarter	
MH 264	An. Geom. & Cal.....5	EC 200	Economics.....5	CE 201	Surveying.....5
CE 202	Intr. to Computer	PS 222	General Physics III.....4	CE 301	Civil Engineering
	Methods in CE.....3	MH 265	Diff. Equations.....3		Analysis.....5
CE 205	Engineering Mech.-	CE 207	Mechanics of Solids.....3	ME 321	Dynamics I.....4
	Statics.....4		General Elective*.....3		Hum.-Soc. Elective**.....3
PS 221	General Physics II.....4				

JUNIOR YEAR

CE 320	Fund. of Transp.	CE 304	Theory of Struct. I.....4	CE 380	Theory of Struct. II.....5
	Engineering.....5	IE 410	Engr. Statistics.....5	CE 406	Intr. to Soil
IE 320	Engineering Econ.....5	GL 315	Engineering Geology.....4		Mechanics.....5
ME 301	Thermodynamics I.....4	CE 308	Hydraulics.....5	CE 312	Hydrology.....4
EHA 304	Technical Writing††.....3	CE 304L	Structures Laboratory..1	CE 308L	Hydraulics Laboratory.1
					Tech. Elective.....2

SENIOR YEAR

CE 404	Structural Analysis.....4	CE 405	Water & Waste Water	CE	Design Elective†.....5
CE 305	Water Supply &		Treatment.....5		Tech. Elective.....7
	Disposal.....5	CE 417	Soil & Foundation		Hum.-Soc. Elective**.....3
EE 300	Fund. of Electrical		Engineering.....3		
	Engineering.....5		Tech. Elective.....3		
	Tech. Elective.....3		Hum.-Soc. Elective**.....6		
	Hum.-Soc. Elective**.....3				

TOTAL—210 QUARTER HOURS

*Requires departmental approval. Three hours of Basic ROTC may be substituted.

**See section on Humanistic-Social Electives. Three hours of Advanced ROTC may be substituted for three hours of Humanistic-Social Electives.

†Design elective must be selected from the approved list.

††Three hours of Advanced ROTC may be substituted.

TECHNICAL ELECTIVES

A list of suggested technical electives may be obtained in the departmental office. Any selection not on the list must be approved by the Head of the Department.

Computer Science and Engineering

Interdepartmental and Interdisciplinary

There are two interdepartmental curricula offered in these areas. The details of the curricula follow.

Computer Science — The Computer Science curriculum, leading to the degree Bachelor of Science in Computer Science, is a liberal-arts oriented curriculum intended to prepare students for careers in programming and systems analysis as well as for graduate work in Computer Science. The curriculum is designed to meet general Auburn University requirements as well as the recommendations of the Association for Computing Machinery.

Curriculum in Computer Science (CS)

FRESHMAN YEAR

First Quarter		Second Quarter		Third Quarter	
EH 101	English Comp.....3	EH 102	English Comp.....3	EH 103	English Comp.....3
MH 161	An. Geom. & Cal.*.....5	MH 162	An. Geom. & Cal.....5	MH 163	An. Geom. & Cal.....5
HY 101	or 204, History.....3	HY 102	or 205, History.....3	HY 103	or 206, History.....3
	Basic Science**.....5		Basic Science**.....5	PS 220	Physics.....4
	Physical Education*.....1		Physical Education*.....1	TS 102	Graph. Communi-
		EE 202	Timesharing &		cation & Design.....2
			Terminal Systems.....2		Physical Education*.....1

SOPHOMORE YEAR

First Quarter			Second Quarter			Third Quarter		
MH 264	An. Geom. & Cal.	5	MH 265	Linear Diff. Eq.	3	MH 266	Linear Algebra	3
PS 221	Physics	4	PS 222	Physics	4	IE 385	Comp. Prog. Sys. I	3
IE 300	Computr. Programng.	3	IE 301	Info. Retrieval & Computr. Programng.	3	SY 201	Intr. to Sociology	5
FL	Foreign Language**	5	FL	Foreign Language	5	FL	Foreign Language	5
				Minor	3		Minor	3
			JUNIOR YEAR					
IE 384	Data Structures	3	IE 555	Advncd. Computer Programng.	3	IE 585	Computer Programng. Systems II	3
EE 330	Analysis & Design of Logic Circuits	4	EE 335	Computr. Org. & Assby. Lang. Program.	4	IE 410	Engr. Statistics	5
MH 515	Alg. for Appld. Math.	5		Minor	5		Minor	5
PO 209	or 210 Political Sci.	5	EH	Literature††	3	EH	Literature††	3
			SENIOR YEAR					
EE 430	Computr. Syst. Design	4	MH 560	or 561 Numerical Anal.	5		Comp. Sci. Req.†††	3
	Comp. Sci. Req.†††	3		Comp. Sci. Req.†††	3		Minor	6
	Minor	5		Minor	3		Free Elec.††††	6
EH	Literature††	3		Free Elec.††††	4			

TOTAL — 201 QUARTER HOURS

- * Students not prepared for MH 161 must begin with MH 160.
 ** Basic Science: ten hours in one science, including corresponding labs, chosen from BI 101-102, 101-103, 101-104; CH 101-102-104, 103-104; GL 101-102, 101-103, 102-103, 110-103.
 * Must be taken on "pass-fail" basis. Basic ROTC may be substituted.
 *** A foreign language through the first-year sequence as a minimum.
 **** MH 269 may be substituted.
 † MH 337 may be substituted.
 †† EH 253-254-255 or EH 260-261-262 or EH 250-251.
 ††† Computer Science Requisites: three courses selected from
 IE 588 Fundamental Algorithms
 IE 587 Language Theory
 EE 527 Systems Programming and Operating Systems
 EE 528 Compiler Construction
 MH 560 or 561, Numerical Analysis
 †††† May substitute three hours basic ROTC and six hours Advanced ROTC for nine hours Free Elective.

Minor

Concentration outside of Computer Science; minimum of 30 hours in one area or 15 hours in each of two areas; suggested concentrations - management, accounting, economics, electrical engineering, industrial engineering, mathematics, selected areas in agriculture; student may develop individual program to meet career goals in consultation with adviser and with approval of the heads of departments offering the courses involved.

Computer Engineering — The Computer Engineering curriculum, leading to the degree Bachelor of Computer Engineering, is a design-oriented curriculum intended to prepare students for careers in logic design, systems programming, and integration of computer systems, as well as for graduate work. The curriculum allows a choice of emphasis on hardware design or on software design.

Curriculum in Computer Engineering (CPE)

Hardware Emphasis

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
MH 161	An. Geom. & Cal.*	5	MH 162	An. Geom. & Cal.	5	MH 163	An. Geom. & Cal.	5
HY 101	or 204, History	3	HY 102	or 205, History	3	HY 103	or 206, History	3
	Basic Science**	5		Basic Science*	5	PS 220	Physics	4
	Physical Education†	1		Physical Education†	1	TS 102	Graphic Communication & Design	2
			EE 202	Timesharing & Terminal Systems	2		Physical Education†	1

SOPHOMORE YEAR

First Quarter	
MH 264	An. Geom. & Cal. ....5
PS 221	Physics .....4
IE 300	Comptr. Programng. ....3
	Hum.-Soc. Elec. ....5

Second Quarter	
MH 265	Linear Diff. Equatns. ....3
PS 222	Physics .....4
IE 301	Info. Retrieval & Comptr. Programng. ....3
IE 385	Comp. Prog. Sys. I ....3
EE 261	Linear Circuit Anal. I ....3
	Hum.-Soc. Elec. ....3

Third Quarter	
MH 266	Linear Algebra .....3
EE 263	Linear Circuit Anal. II ....4
EE 264	Lin. Circ. Lab. ....1
EE 330	Analysis & Design of Logic Circuits .....4
IE 384	Data Structures .....3
	Hum.-Soc. Elec. ***3

JUNIOR YEAR

EE 335	Computr. Organiztn. & Assmby. Lang. Program 4
EE 382	Linear Systems .....5
IE 410	Engr. Statistics .....5
ME 205	Statics .....4
MH 515	Alg. for App. Math. ....5
EE 430	Computr. Syst. Design. 4
IE 585	Comp. Prog. Sys. II ....3
EHA 304	Tech. Writing ***3
	CSE Elective .....3

IE 411	Operatn. Research .....5
EE 524	Microcomputers .....4
ME 301	Thermodynamics .....4
IE 327	Engr. Econ. Analysis .....5

SENIOR YEAR

EE 527	Syst. Programng. & Operating Syst. ....3
	Tech. Elective .....3
	CSE Elective .....5
	Hum.-Soc. Elec. ....5
IE 555	Adv. Comptr. Prog. ....3
EE 520	Comptr. Graphics .....4
IE 587	Formal Theory of Comptr. Lang. ....3
	CSE Elective .....3
	Technical Elec. ****3

IE 588	Fund. Algorithms .....3
EE 528	Compiler Constrctn. ....3
EE 530	Seminar .....1
	Hum.-Soc. Elec. ....3
	CSE Elective .....3
	Technical Elec. ....3

TOTAL — 210 QUARTER HOURS

* Students not prepared for MH 161 must begin with MH 160.

** Basic Science: ten hours in one science, including corresponding labs, chosen from BI 101-102, 101-103, 101-104; CH 101-102-104, 103-104; GL 101-102, 101-103, 102-103, 110-103.

*** May substitute Advanced ROTC (six hours) for EHA 304 (three hours) and Humanistic-Social Elective (three hours).

**** Basic ROTC (three hours) may be substituted for Technical Elective (three hours).

† Must be taken on "pass-fail" basis. Basic ROTC may be substituted.

Curriculum in Computer Engineering (CPE)

Software Emphasis

FRESHMAN YEAR

First Quarter	
EH 101	English Comp. ....3
MH 161	An. Geom. & Cal. *5
HY 101	or 204. History .....3
	Basic Science** .....5
	Physical Education* ....1

Second Quarter	
EH 102	English Comp. ....3
MH 162	An. Geom. & Cal. ....5
HY 102	or 205. History .....3
	Basic Science** .....5
	Physical Education* ....1
EE 202	Timesharing & Terminal Systems .....2

Third Quarter	
EH 103	English Comp. ....3
MH 163	An. Geom. & Cal. ....5
HY 103	or 206. History .....3
PS 220	Physics .....4
TS 102	Graphic Communi- cation & Design .....2
	Physical Education* ....1

SOPHOMORE YEAR

MH 264	An. Geom. & Cal. ....5
PS 221	Physics .....4
IE 300	Comptr. Programng. ....3
	Hum.-Soc. Elec. ....5

MH 265	Lin. Diff. Equatns. ....3
PS 222	Physics .....4
IE 301	Info. Retrieval & Comptr. Programng. ....3
IE 385	Comp. Prog. Sys. I ....3
EE 261	Linear Circ. An. I ....3
	Hum.-Soc. Elec. ....3

MH 266	Linear Alg. ....3
EE 263	Linear Circ. An. II ....4
EE 264	Linear Circ. Lab. ....1
IE 305	Info. Decisn. Sysms. ....3
EC 200	Economics .....5

JUNIOR YEAR

IE 327	Engr. Econ. Analysis ....5
IE 384	Data Structures .....3
EE 330	Analysis & Design of Logic Circuits .....4
	Hum.-Soc. Elec. ***6
MH 515	Alg. for Appld. Math. ....5
IE 410	Engr. Statistics .....5
EE 335	Computr. Organiztn. & Assmby. Lang. Program 4
EHA 304	Tech. Writing ***3

IE 411	Operatn. Research .....5
ME 205	Statics .....4
IE 416	Simulation .....3
	CSE Elective .....5

SENIOR YEAR

IE 585	Comp. Prog. Sys. II ....3
MH 561	Numerical Matrix Anal. 5
ME 321	Dynamics .....4
	Engr. Sci. Elective .....3
	Hum.-Soc. Elec. ....3
IE 427	****3
IE 555	Adv. Comptr. Prog. ....3
	CSE Elective .....4
	Engr. Sci. Elective .....3
	Technical Elec. ....4

IE 428	****3
	Free Elective† .....5
	CSE Elective .....5
	Technical Elec. ....4

TOTAL — 210 QUARTER HOURS

* Students not prepared for MH 161 must begin with MH 160.

** Basic Science: ten hours in one science, including corresponding labs, chosen from BI 101-102, 101-103, 101-104; CH 101-102-104, 103-104; GL 101-102, 101-103, 102-103, 110-103.

*** Must be taken on "pass-fail" basis. Basic ROTC may be substituted.

**** May substitute Advanced ROTC (six hours) for EHA 304 (three hours) and Humanistic-Social Elective (three hours).

***** A two-quarter senior design project; design principles and concepts of complex systems (Operations and Facilities Design I and II).

† Basic ROTC (three hours) may be substituted for Free Elective (three hours).

Computer Science and Engineering (CSE) Electives

MH 560	Introduction to Numerical Analysis	EE 430	Computer Systems Design
MH 561	Numerical Matrix Analysis	EE 520	Fundamentals of Computer Graphics Systems
MH 575	Graph Theory	EE 521	Introduction to Artificial Intelligence
IE 305	Electronic Data Processing Systems Design	EE 523	Fault Diagnosis of Digital Systems
IE 416	Simulation	EE 524	Microcomputers
IE 556	Intermediate Simulation	EE 527	Systems Programming and Operating Systems
IE 586	Information Organization and Retrieval	EE 528	Compiler Construction
IE 587	Formal Theory of Computer Languages	EE 530	Seminar
IE 588	Fundamental Algorithms	EE 547	Digital Signal Processing
IE 589	Advanced Data Processing	EE 551	Hybrid Computation

Technical Electives, Engineering Science Electives

A list of approved electives in these areas may be obtained from the Office of the Coordinator, Computer Science and Engineering.

Department of Electrical Engineering

The Electrical Engineering curriculum is organized around six basic areas of study. They are Circuit Analysis, Electronics and Communications, Energy Conversion and Transmission, Electromagnetic Fields, Automatic Control, and Computer Engineering. In addition, technical electives in the senior year provide flexibility in the curriculum to accommodate the diversity of interests and talents among the students. A student, through his choice of technical electives, can concentrate on a topic of individual interest or choose a combination of electives from different areas to maintain a broad program. Electives relevant to each of the specialized topics in Electrical Engineering, along with additional courses which are related to these topics, are grouped on an approved list available from the Electrical Engineering Department.

Curriculum in Electrical Engineering (EE)

FRESHMAN YEAR

(See Pre-Engineering Curriculum)

SOPHOMORE YEAR

First Quarter			Second Quarter			Third Quarter		
MH 264	An. Geom. & Cal.	5	ME 205	Statics	4	EE 263	Circuit Analysis II	4
PS 221	Gen. Physics II	4	PS 222	Gen. Physics III	4	ME 207	Strength of Mtl's I	3
EE 201	Intr. to Computer Prog.	3	MH 265	Linear Diff. Equatns.	3	MH 266	Linear Algebra	3
	Hum.-Soc. Elective*	5	EE 261	Circuit Analysis I	3	PS 320	Mod. Phy. for Engr.	3
				Hum.-Soc. Elective*	3	EE 264	Lin. Cir. An. II Lab.	1
							Hum.-Soc. Elective*	3

JUNIOR YEAR

EE 362	Linear Systems	5	EE 351	Linear Feedback Sys.	4	EE 352	Nonlinear Systems	4
ME 321	Dynamics I	4	EE 330	An. & Des. Logic Cir.	4	EE 335	Comp. Organizatn.	4
EE 391	Electromag. I	3	EE 371	Electronics I	3	EE 374	Electronics II	4
IE 311	Engr. Statistics I	3	EE 392	Electromag. II	3	EE 385	Power Sys. Analysis I	4
	Hum.-Soc. Elective*	3	EHA 304	Tech. Writing	3			

SENIOR YEAR

EE 475	Electronics III	5	EE 492	Electromag. III	4	EE 441	Comm. Theory	5
EE 481	Energy Conversion	5	ME 301	Thermodynamics I	4		Tech. Elective**	9
EE 430	Comp. Sys. Design	4	EE 489	Energy Convrsn. Lab.	2		Hum.-Soc. Elective*	3
IE 327	Engr. Econ. Analysis	5		Tech. Elective**	5			
				Hum.-Soc. Elective*	3			

TOTAL—210 QUARTER HOURS

Basic ROTC may be substituted for three hours of Humanistic-Social Electives. Advanced ROTC may be substituted for EH 304 and three hours of Technical Electives.

*Humanistic-Social Electives selected from approved list.

**Selected from an approved list obtained from the Electrical Engineering Department Office.

Department of Industrial Engineering

Industrial Engineering differs from other branches of the engineering profession in three basic ways. First, it covers all types of industrial, commercial, and service activity. Second, it gives substantial emphasis to the role of people as well as machines and materials in systems design. Third, it becomes heavily involved in the economic and financial aspects of the problems it considers. While the Industrial Engineer is still concerned with production systems, many non-industrial organizations have recognized the value of Industrial Engineering techniques, and Industrial Engineers are practicing in health, marketing, financial, governmental, military, transportation, educational, agricultural, and consulting organizations. Furthermore, they have increasingly become involved in interdisciplinary activities.

The Industrial Engineering curriculum emphasizes the systems approach to design, operation, and control, and provides the student with competencies in quantitative and qualitative analysis and solution procedures to the resource utilization, data processing, information flow, management, economic, and human factors problems associated with almost any system. The curriculum includes departmental courses in the areas of: computer systems and programming, simulation, mathematical optimization methods, probability and statistics, operation research, production processes, facilities design, human performance, and the design of man's work environment and work methods. An elective program equivalent to approximately two quarters' course work permits the student to pursue further topics of personal and professional interest.

A wide variety of employment opportunities is available to the Industrial Engineer since his competencies are required by almost all manufacturing and service organizations. Additionally, industrial engineering is excellent training for top management positions.

An option in computer science is available to the student wishing to specialize in this important area of industrial engineering practice.

Curriculum in Industrial Engineering (IE)

FRESHMAN YEAR

(See Pre-Engineering Curriculum)

SOPHOMORE YEAR

Second Quarter

IE 202	Indust. Engr. Fund.	3
MH 264	An. Geom. & Cal.	5
PG 211	Gen. Psychology	5
PS 221	Gen. Physics II	4

IE 300	Computer Prog.	3
MH 265	Diff. Equations	3
EC 200	Economics I	5
PS 222	Gen. Physics III	4
	Basic ROTC or	
	Elective	3

IE 311	Engr. Statistics I	3
IE 327	Engr. Econ. Analysis	5
PS 320	Modern Physics	3
EHA 304	Tech. Writing	3
	Hum.-Soc. Elec.	3

JUNIOR YEAR

IE 323	Engr. Statistics II	5
IE 305	Info-Decsn. Syst.	3
PG 321	Exp. Psych. II	5
	Perception	5
ME 301	Thermodynamics I	4
	Hum.-Soc. Elective	2

IE 308	Ergonomics I	4
IE 333	Engr. Statistics III	4
IE 335	Linear Programng.	4
EE 261	Linear Circuits	3
	Analysis I	3
	Tech. Elective	3

IE 408	Ergonomics II	5
IE 415	Operns. Research	5
	Models	5
EE 263	Circuits Analysis II	4
	Tech. Elective	3

SENIOR YEAR

IE 416	Simulation	3
IE 422	Production Control	4
	Functions I	4
ME 205	Statics	4
	Tech. Elective	5

IE 425	Prod. Cont. Func. II	3
IE 427	Oper. & Fac. Design I	3
ME 207	Strength of Mats. I	3
	Tech. Elective	6

IE 428	Operns. &	
	Facilities Design II	3
ME 321	Dynamics	4
	Free Elective	5
	Tech. Elective	3

TOTAL—206 QUARTER HOURS

*Another basic science course may be substituted on a "course for course basis" upon approval of the student's adviser.

SUGGESTED ELECTIVES

A pamphlet describing the student's elective options and suggested courses is available in the IE department offices. Elective courses are available in all fields of engineering represented on campus, computer science, operations research, statistics, production analysis, management economics, psychology and human performance, mathematics, environmental quality, and ecology. Six hours of advanced ROTC may be substituted for three hours of free electives and EHA 304.

Computer Science Option

Freshman and Sophomore years same as in Industrial Engineering Curriculum.

JUNIOR YEAR		
First Quarter		
IE 323	Engr. Stat. II.....5	
IE 305	Info-Decsn. Syst. ....3	
PG 321	Exp. Psych. II.....5	
ME 301	Thermodynamics I.....4	
	Hum.-Soc. Elective.....2	
Second Quarter		
IE 308	Ergonomics I.....4	
IE 333	Engr. Statistics III.....4	
IE 335	Linear Programming.....4	
IE 384	Data Structures.....3	
EE 261	Linear Circuits Analysis I.....3	
Third Quarter		
IE 408	Ergonomics II.....5	
IE 415	Oper. Research Models.....5	
IE 385	Comp. Prog. Sys. I.....3	
EE 263	Linear Circuits Analysis II.....4	
SENIOR YEAR		
First Quarter		
IE 416	Simulation.....3	
IE 422	Production Control Functions I.....4	
ME 205	Statics.....4	
MH 561	Numer. Matrix Anal.....5	
Second Quarter		
IE 425	Production Control Functions II.....3	
IE 427	Optimns & Facilities Design I.....3	
ME 207	Strength of Matts.....3	
EE 330	Analysis & Design of Logic Circuits.....4	
	Computer Science Elective*.....3	
Third Quarter		
IE 428	Oper. & Fac. Design II.....3	
ME 321	Dynamics.....4	
	Computer Science Electives*.....7	
TOTAL—206 QUARTER HOURS		

*These hours must come from the following two groups of courses with at least one course from each group: (1) IE 301, IE 555, IE 585, (2) IE 553, IE 586, MH 331, MH 505, MH 560.

Department of Mechanical Engineering

The basic engineering science fields of engineering mechanics, materials science, thermodynamics, fluid mechanics, and heat and mass transfer are covered in depth in this curriculum to give students understanding and the ability to solve problems in these areas. In addition, there are professional subjects offering instruction in combustion engines, including gas turbines and rockets, power plants, air conditioning, refrigeration, automatic controls, turbomachinery and machine design. A series of courses in electrical subjects is also included to equip the graduate with needed fundamental knowledge in this rapidly expanding field.

Modern design courses at senior level, employing both the group project and the individual project techniques, provide an opportunity for the student to solve typical engineering problems, requiring the development of skill and cooperation in creative design, analysis, and synthesis.

Technical electives are provided in the senior year to enable students to specialize to a limited extent, including a sequence in optimization theory.

Curriculum in Mechanical Engineering (ME)

FRESHMAN YEAR

(See Pre-Engineering Curriculum)

SOPHOMORE YEAR

First Quarter		
MH 264	An. Geom. & Cal.....5	
PS 221	General Physics II.....4	
ME 205	Applied Mechanics-Statics.....4	
	Basic ROTC or Elect.....4	
Second Quarter		
PS 222	General Physics III.....4	
ME 202	Engr. Materials Science-Structure.....3	
ME 207	Strength of Matts. I.....3	
MH 265	Linear Diff. Equatns.....3	
ME 211	Engr. Methods.....2	
	Basic ROTC or Elect.....1	
Third Quarter		
ME 301	Thermodynamics I.....4	
ME 321	Dynamics I.....4	
EE 261	Linear Circuit Anal. I.....3	
MH 362	Engr. Math. I.....3	
ME 309	Correlative Experimental Mechanics.....2	
	Basic ROTC or Elect.....1	
JUNIOR YEAR		
First Quarter		
ME 322	Dynamics II.....4	
ME 316	Strength of Matts. II.....4	
ME 308	Computations Lab.....3	
EE 263	Linear Circuit Anal. II.....4	
SC 202	App. Sp. Comm. I or App. Sp. Comm. II.....3	
EHA 304	Tech. Writing I.....3	
Second Quarter		
ME 323	Dynamics of Machs.....4	
ME 304	Engr. Materials Science-Properties.....3	
ME 302	Thermodynamics II.....3	
ME 340	Fluid Mechanics I.....3	
	Electrical Science Elective*.....3	
Third Quarter		
ME 335	Engr. Materials Science-Metallurgy.....4	
ME 341	Fluid Mechanics II.....4	
ME 303	Thermodynamics III.....3	
PS 320	Modern Phy. for Engr.....3	
	Hum.-Soc. Elective*.....3	

First Quarter			SENIOR YEAR			Third Quarter		
ME 521	Heat Transfer	4	ME 515	Thermodynamics of Power Systems	4	ME 451	Advanced Projects	3
ME 439	Mech. Engr. Design I	4	ME 440	Mech. Design II	3	ME 420	Thermal Systems Laboratory	2
ME 527	Dynamics of Physical Systems	4	ME 522	Transport Processes	3		Hum.-Soc. Elective*	9
	Hum.-Soc. Elective*	3	ME 412	Measurements Lab	3		Technical Elective	4
	Technical Elective	3		Hum.-Soc. Elective*	3			
				Technical Elective	3			

TOTAL—210 QUARTER HOURS

†Six hours of Advanced ROTC may be substituted for SC 202 (3 hrs.) or EH 304 (3 hrs.) and three additional hours approved by the Department Head.

*See section on Humanistic-Social Electives.

**Electrical Science Elective must be EE 301 Engineering Instrumentation or EE 371 Electronics I.

NOTE: The recommended technical elective sequence in optimization theory is MH 310 and ME 502. Additional courses following this sequence are available.

SUGGESTED TECHNICAL ELECTIVES

Selected from approved list which can be obtained from the Mechanical Engineering Department or the office of the Dean of Engineering.

Materials Engineering

The curriculum in Materials Engineering is administered by the Department of Mechanical Engineering of the School of Engineering. It is an interdisciplinary curriculum conducted cooperatively by academic departments of the School of Engineering and the School of Arts and Sciences through a faculty Materials Engineering Curriculum Committee.

Materials Engineering includes both the design of materials and materials processes to meet specific needs. Materials engineers are employed in the basic metallurgical, ceramics, plastics, electronics, aerospace, mechanical, process, chemical, and nuclear power industries.

The curriculum in Materials Engineering includes the basic sciences, engineering sciences, and particularly the science of the relationship of structure to properties.

Materials Engineering courses include the subjects of ceramic, metallic, and plastic materials design with the emphasis placed upon the structure of each type and its influence on the properties and performance in service. Fundamental relationships are emphasized to prepare the engineer to meet effectively modern design challenges that will be encountered.

Curriculum in Materials Engineering (MTL)

FRESHMAN YEAR

(See Pre-Engineering Curriculum)

SOPHOMORE YEAR

First Quarter			Second Quarter			Third Quarter		
MH 264	An. Geom. & Cal.	5	PS 222	Gen. Physics III	4	CH 507	Physical Chem.	5
PS 221	Gen. Physics II	4	MH 265	Linear Diff. Equations	3	ME 301	Thermodynamics I	4
ME 205	Applied Mechanics		MTL 202	Engr. Materials		MTL 304	Engr. Materials	
	Statics	4		Science-Structure	3		Science-Properties	3
	Basic ROTC or Elect.	3	ME 207	Strength of Matis. I	3	ME 308	Computation Lab.	3
				Basic ROTC or Elect.	3	EE 261	Linear Circuit Anal.	3

JUNIOR YEAR

CH 508	Physical Chem.	5	MTL 338	Phase Diagrams	4	MTL 336	Physical Analysis	
MTL 335	Engr. Matis. Science-Physical Metallurgy	4	MTL 536	Engr. Matis. Science-Ferrous Metallurgy	3		of Matis. I	4
EE 263	Linear Circuit Analysis II	4	MTL 515	Polymer Technology I	4	MTL 425	Thermo. of Matis. Syst.	4
ME 521	Heat Transfer	4	SC 202	App. Sp. Comm. or Tech. Writing†	3	MTL 448	Intr. to Ceramics	3
			EHA 304	Technical Elective	5	MTL 516	Polymer Tech. II	3
							Hum.-Soc. Elect.*	3

SENIOR YEAR					
First Quarter		Second Quarter		Third Quarter	
MTL 337	Phys. Analysis of Matls. II.....4	MTL 435	Phys. Analysis of Matls. III.....4	MTL 446	Theoretical Matls. Engr.....3
MTL 445	Transformations in Condensed Phases.....4	MTL 575	Rate Processes Matls.....3	MTL 447	Mechanics of Engr. Matls.....4
	Technical Elect.....5	MTL 570	Electric Properties of Materials.....3	ME 451	Advanced Projects.....3
	Hum.-Soc. Elect.*.....5		Hum.-Soc. Elect.*.....6	MTL 513	Intr. to X-ray Crystallography.....5
			Technical Elect.....1		Hum.-Soc. Elect.*.....3

TOTAL—210 QUARTER HOURS

†Six hours of Advanced ROTC may be substituted for SC 202 (3 hrs.) or EH 304 (3 hrs.) and three additional hours approved by the Chairman of the Materials Engineering Curriculum Committee.

*See section on Humanistic-Social Electives.

NOTE: The sequence CH 111 and CH 112 may be substituted for the sequence CH 103/CH 103L and CH 104/CH 104L.

SUGGESTED TECHNICAL ELECTIVES

Selected from approved list which can be obtained from the chairman of the Materials Engineering Curriculum Committee.

Department of Textile Engineering

The programs in the Department of Textile Engineering are designed to be sufficiently flexible to serve the needs of the student who seeks a career in the textile industry. Textiles is a truly multi-disciplinary program, and frequently a career in this field will draw on knowledge from the sciences, arts, combinations of these, economics, business and others.

The curricula are planned to provide for the needs of students as perceived by them and assisted by the faculty of the department.

Well equipped laboratories complement the lecture program. These laboratories represent the types of equipment, bench study and research capabilities so vital to the learning of and contributing to a career in the industry.

The size and diversity of textiles and the allied industries provide careers in manufacturing, research, machinery design, chemicals and dyestuffs, sales, styling and design, technical service and others. Too, the student has the opportunity to prepare for graduate school if he or she desires.

For those students who want to plan their education path in conjunction with industrial experience the Alabama textile industry cooperates with the Department of Textile Engineering through the Cooperative Education Program as described on page 46.

The Textile Engineering Department conducts both applied and fundamental research. In cooperation with the Engineering Experiment Station, and other segments of the University, the Department serves textiles through the utilization of its facilities. In conjunction with research undertaken by the faculty, undergraduates may have the opportunity to conduct research in areas of their special interest. Graduate students from other disciplines are welcome to conduct approved research that may be applied toward their graduate program requirements.

The Department of Textile Engineering offers three curricula to prepare for a career in one of the many facets of the industry. Textile courses in these curricula are combined with courses offered by other departments of the University to provide basic instruction in the fundamental sciences, engineering, technology and humanistic-social studies. The three curricula are:

Textile Engineering—The curriculum in Textile Engineering offers study in basic engineering. It includes engineering science, humanistic-social studies, and the textile subjects needed for a fundamental understanding of the textile processes, materials and

industry. It prepares students for graduate study and careers in textile research, engineering, production and management in the primary textile industry and allied industries, such as the manufacture of textile machinery and man-made fibers.

Textile Chemistry—Students in this curriculum study the chemistry and physics of natural and man-made fibers and the theory and practice of textile dyeing and finishing. It prepares students for graduate work and careers as chemists and dyers in the textile, man-made fibers, dyestuff and other industries allied to textiles.

Textile Management and Technology—This curriculum prepares students for production, administrative, and managerial positions in a textile career. In their junior and senior years students major in production, sales, or design according to their professional needs. Each of the three curricula offered provide students an opportunity to select courses in other disciplines through technical elective sequences. The course sequences may be in disciplines such as Consumer Affairs, Economics, Industrial Engineering, Management, and Marketing.

Curriculum in Textile Engineering (TE)

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
MH	161	An. Geom. & Cal.....5	MH	162	An. Geom. & Cal.....5	MH	163	An. Geom. & Cal.....5
CH	103	Funds of Chem. I.....4	CH	104	Funds of Chem. II.....4	PS	220	Gen. Physics I.....4
CH	103L	Gen. Chem. Lab.....1	CH	104L	Gen. Chem. Lab.....1	EH	103	English Comp.....3
EH	101	English Comp.....3	EH	102	English Comp.....3	TE	101	Intr. Textiles.....3
		Free Elective.....1	TS	102	Graph. Com. & Design.....2			Basic ROTC or Elec.....1
		Basic ROTC or Elec.....1			Free Elective.....1	PE		Physical Education††.....1
PE		Physical Education††.....1	PE		Basic ROTC or Elec.....1			
					Physical Education††.....1			

SOPHOMORE YEAR

TE	231	Textile Fibers I.....5	TE	232	Textile Fibers II.....5	TE	211	Yarn Forming Syst.....5
MH	264	An. Geom. & Cal.....5	PS	222	Gen. Physics III.....4	TE	221	Fabric Forming Syst.....5
PS	221	Gen. Physics II.....4	MH	265	Linear Diff. Equatns.....3	ME	205	App. Mech. Statics.....4
HY		History*.....3	ME	202	Structures.....3	HY		History*.....3
		Basic ROTC or Elec.....1	HY		History*.....3			Basic ROTC or Elec.....1
					Basic ROTC or Elec.....1			

JUNIOR YEAR

ME	301	Thermodynamics I.....4	EE	263	Circuit Analysis II.....4	TE	241	Dyeing & Finishing.....5
TE	212	Special Topics on Yarn Mfg.....4	ME	207	Strngth. of Matls.....3	ME	321	Dynamics I.....4
EE	261	Circuit Analysis I.....3	TE	321	Knit Structures.....3	EE	301	Instrumentation.....3
TE	222	Woven Structures.....3	PS	320	Mod. Phys/Engrs.....3	ME	340	Fluid Mechanics I.....3
TE	213	Prep. of Yarns for Fabric Forming.....2	IE	201	Industrial Admin.....3	IE	204	Computer Prog.....3

SENIOR YEAR

EC	200	Gen. Economics.....5	PG	211	Gen. Psychology.....5	TE	380	Textile Costing.....5
TE	350	Test. of Textile Matls.....5	TE	351	Analysis of Textile Fabric Structures.....5	TE	322	Non-Conven. Fab.....3
EHA	304	Tech. Writing†.....3	TE	352	Quality Control.....3			Technical Elective**.....5
SC	202	App. Sp. Comm.†.....3			Technical Elective**.....4			Hum-Soc. Elective.....3

TOTAL—205 QUARTER HOURS

*Selected from the sequence of either HY 204-205-206, or HY 101-102-103.

**Selected from approved sequence.

†Six hours of Advanced ROTC may be substituted for SC 202 (3 hrs.) and EH 304 (3 hrs.).

††Must be taken on "pass-fail" basis.

Curriculum in Textile Chemistry (TC)

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
CH	111	General Chemistry.....5	CH	112	General Chemistry.....5	CH	113	General Chemistry.....5
MH	160	Algebra & Trig.....5	MH	161	An. Geom. & Cal.....5	MH	162	An. Geom. & Cal.....5
EH	101	English Comp.....3	EH	102	English Comp.....3	EH	103	English Comp.....3
TE	101	Intr. Textiles.....3	HY		History*.....3	HY		History*.....3
		Basic ROTC or Elec.....1			Basic ROTC or Elec.....1			Basic ROTC or Elec.....1
PE		Physical Education††.....1	PE		Physical Education††.....1	PE		Physical Education††.....1

SOPHOMORE YEAR

First Quarter	
MH 163	An. Geom. & Cal.....5
TE 231	Textile Fibers I.....5
CH 204	Anal. Chemistry.....3
CH 204L	Anal. Chem. Lab.....2
HY	History*.....3
	Basic ROTC or Elect.....1

Second Quarter	
MH 264	An. Geom. & Cal.....5
CH 205	Anal. Chemistry.....5
TE 232	Textile Fibers II.....5
	Basic ROTC or Elect.....1

Third Quarter	
PO 209	Intr. Am. Govt.....5
PA 202	Ethics & Society.....5
TE 211	Yarn Forming Syst.....5
SC 202	Appl. Sp. Comm.†.....3
	Basic ROTC or Elect.....1

JUNIOR YEAR

PS 205	Intr. Physics.....5
TE 221	Fabric Forming Syst.....5
TE 241	Dyeing & Finishing.....5
TE 213	Prep. of Yarns for Fabric Forming.....2

PS 206	Intr. Physics.....5
TE 212	Spec. Top. on Yn. Mfg.4
TE 222	Woven Structures.....3
TE 242	Chem. Tech. of Bleach. Dye. & Finishing.....3
	Hum-Soc. Elective.....3

CH 303	Organic Chem.....5
TE 321	Knit Structures.....3
TE 342	Analyt. Instrumentation in Textiles.....3
EHA 304	Tech. Writing†.....3
	Hum-Soc. Elective.....3

SENIOR YEAR

CH 304	Organic Chemistry.....5
TE 350	Test. of Textile Matl.....5
	Technical Elective.....5

CH 507	Physical Chemistry.....5
TE 441	Advncd. Dyeing.....5
TE 351	Analysis of Textile Fabric Structures.....5

CH 508	Physical Chemistry.....5
TE 380	Textile Costing.....5
	Technical Elective.....5

TOTAL—205 QUARTER HOURS

*Selected from the sequence of either HY 204-205-206, or HY 101-102-103.

†Six hours of Advanced ROTC may be substituted for SC 202 (3 hrs.) & EH 304 (3 hrs.)

††Must be taken on "pass-fail" basis.

Curriculum in Textile Management and Technology (TMT)

FRESHMAN YEAR

First Quarter	
MH 160	Pre. Cal. W. Trig.....5
TE 101	Intr. To Textiles.....3
EH 101	English Comp.....3
TS 102	Graph. Com. & Design.2
HY 204	Tech. & Civil. I.....3
PE	Physical Education††.....1

Second Quarter	
TE 141	Textile Chemistry.....5
MH 161	An. Geom. & Cal.....5
EH 102	English Comp.....3
HY 205	Tech. & Civil. II.....3
PE	Physical Education††.....1

Third Quarter	
TE 221	Fab. Form. Systems.....5
CH 103	Fund. of Chem. I.....4
CH 103L	Gen. Chem. Lab.....1
EH 103	English Comp.....3
HY 206	Tech. & Civil. III.....3
PE	Physical Education††.....1

SOPHOMORE YEAR

TE 211	Yarn Form. Systems.....5
TE 231	Textile Fibers I.....5
CH 104	Fund. of Chem. II.....4
CH 104L	Gen. Chem. Lab.....1
IE 204	Computer Prog.....3

TE 241	Dyeing & Finishing.....5
TE 232	Textile Fibers II.....5
EC 200	Gen. Economics.....5
TE 212	Special Topics in Yarn Mfg.....4

EC 202	Economics II.....5
PS 205	Intr. Physics.....5
TE 222	Woven Structures.....3
TE 242	Chem. Tech. Bleach. Dye. & Finishing.....3
TE 213	Prep. Yarns for Fabric Forming.....2

JUNIOR YEAR

IE 220	Applied Statistics.....5
TE 321	Knit Structures.....3
TE 342	Analyt. Instrum. In Textiles.....3
TE 311	Textured Yarns.....2
TE 322	Non Conv. Fab. Struct.3

ACF 215	Fund. Acctng.....5
TE 350	Test. of Textile Matl.....5
TE 325	Desgn. Textile Fab.....4
EHA 304	Tech. Writing†.....3

TE 380	Textile Costing.....5
SC 211	Speech Comm.†.....5
TE 351	Analysis of Textile Fabric Struct.....5
TE 352	Textile Qual. Control.....3

SENIOR YEAR

TE 490	Undergrad. Resch. I.....5
	Tech. Electives*.....9
	Free Electives†.....3

TE 491	Undergrad. Resch. II.....5
TE 480	Plant Design, Opern. & Control I.....4
	Tech. Electives*.....6
	Free Electives.....3

TE 481	Plant Design, Opern. & Control II.....4
	Tech. Electives*.....10
	Free Electives.....3

TOTAL—209 QUARTER HOURS

†Nine hours of ROTC (Basic 6, Advanced 3) may be substituted for SC 211 (5 hours), EH 304 (3 hours), and 1 hour of free elective.

††Must be taken on "pass-fail" basis. Basic ROTC may be substituted.

*Selected from an approved sequence.

Auburn University Aviation

Gary W. Kiteley, Director

Auburn University Aviation was established in 1942 as a department of the School of Engineering to offer flight education for students of the University, for the Armed Forces, and for the general public; and to serve the citizens of Alabama and the Southern region by providing other services in aviation. The department cooperates fully with the Federal Aviation Administration and other organizations in conducting special aviation research and education programs.

In conjunction with the Aerospace Engineering Department, Aviation serves as a laboratory of practical instruction for students enrolled in the curricula of Aviation Management and Aerospace Engineering. Flight courses offered lead to FAA private, commercial, multi-engine, instrument, flight instructor (airplane and instrument), and airline transport certificates and ratings.

The University owns and operates the 334-acre Auburn-Opelika R. G. Pitts Airport, conveniently located within three miles of the campus, with two lighted, 4000-foot, paved runways; a two-story administration building; two large hangars, two five-unit T-hangars, and one five-unit Planeport. The department currently operates twelve single and multi-engine aircraft, plus one flight simulator.

In addition to flight education, other services such as fuel, maintenance and airplane storage are provided at the airport. AU Aviation also provides air transportation for University faculty and staff on official University business.

The department is fully certified by the FAA as an Air Agency with examining authority for private, commercial, and instrument courses, and is also approved by the State Department of Education for flight instruction under the U.S. Veterans Administration education program.

School of Home Economics

RUTH L. GALBRAITH, *Dean*

HOME ECONOMICS is a professional program with its roots in the arts, sciences, and humanities. It is a complex of studies serving many purposes — broad liberal education, preparation for careers, and a background for home and family living. Areas of specialization are concerned with many aspects of environment, health, and human development. With emphasis on both breadth of knowledge and its application to the solution of human problems, Home Economics offers professional or pre-professional preparation for an increasing variety of positions with opportunities available in education, business, industry, and government.

Programs of study leading to the Bachelor of Science degree can be planned within eleven curricula in the School of Home Economics. These curricula are designed with flexibility to meet the needs of students with varying interests. The School includes the Departments of Consumer Affairs, Family and Child Development, and Nutrition and Foods.

Students within any curricula may elect to complement their major area of study with a multi-disciplinary Certificate in Aging Studies, composed of 25 hours (see page 185). Students should contact the Academic Adviser for further information.

Department of Consumer Affairs

The Department of Consumer Affairs focuses on the near physical environment and resources, including personal interaction with this environment. Six majors are offered in this department: Clothing, Textiles, and Related Art; Fashion Merchandising; Housing; Interior Furnishings and Equipment; Family Resource Management; and Consumer and Family Economics. These curricula lead to careers in business and government which apply science and technology to study consumer needs, to evaluate consumer products, and to inform consumers of the findings.

Clothing, Textiles, and Related Art (CTC, CTD, CTT)

Clothing, Textiles, and Related Art is a professional three-option curriculum providing preparation in areas of specialization related to students' professional goals. Diversification within the major allows application of knowledge in such varied fields as textile and apparel design, production and promotion; textile science; fashion journalism; and consumer-producer relations. A unique interdisciplinary potential involving Clothing and Textiles, Textile Engineering, the School of Business, the Agricultural Experiment Station (for research) and the Cooperative Extension Service exists on one campus located in a textile area.

Curriculum in Clothing, Textiles, and Related Art (CT)

Options: Clothing (CTC), Textile Design (CTD), Textile Science (CTT)

Curriculum Core - 96 hours

EH 101, 102, 103 English Comp.....	9	CH 104 Fund. of Chemistry II.....	4
MH 140 College Algebra or.....		CH 104L Gen. Chem. Lab.....	1
MH 160 Pre-Calculus with Trig.**.....	5	CH 203 Organic Chemistry**.....	5
EH 253, 254, 261, or 262 Literature.....	6	CA 113 Housing for Man.....	3
SC 202 Applied Speech Comm.....	3	CA 115 Clothing and Man.....	3
JM 315 Tech. Journalism.....	3	CA 116 Art for Living I.....	3
HY/ AT*.....	9	CA 116L Art for Living Lab.....	2
PG 211 Psychology I.....	5	CA 225 Textiles.....	5
SY 201 Intr. to Sociology.....	5	CA 323 Man the Consumer.....	3
EC 200 Economics I.....	5	CA 398 Professional Planning & Development.....	1
CH 103 Fund. of Chemistry.....	4	CA 431 Man-Environ. Rel.....	2
CH 103L Gen. Chem. Lab.....	1	NF 112 Nutrition and Man.....	3
		FCD 157 Fam. and Human Dev.....	3
		Liberal Ed. Elective.....	3

*Students may take any combination of World History, HY 101-102-103; Tech. and Civilization, HY 204-205-206; History of Art, AT 171-172-173.

**Textile Science majors omit CH 203 and take MH 160, CH 207, 207L.

Clothing Option (CTC) — Required Courses - 59 hours

CA 105 Fund. of Clothing.....	5	CA 395 Clothing Design.....	5
CA 205 Cloth. Cons. and Sel.....	3	CA 505 Costume Draping.....	5
CA 206 Garment Structure.....	5	CA 525 History of Costume.....	5
CA 226 Fashion Sketching.....	3	CA 555 Flat Pattern Design.....	5
CA 313 Home Furnishings.....	5	CA 556 Comp. Meth. App. Prod.....	5
CA 316 Fashion Analysis.....	5	ANT 203 Intr. to Anthropology.....	5
CA 385 Weaving.....	3		

Approved professional electives - 36 credit hours to be selected.

20-23 hours to be selected from among:

CA 209, 216, 325, 334, 336, 343, 399, 490, 511, 511L, 515, 516, 521, 524, 530, 535, 538, 553, 575, 576, 580A, 583, 587, 588.

13-16 hours to be selected from among:

EC 202; MN 274, 375; PG 330, 531; SY 204, 310, 411; JM 221, 322, 421; AT 112, 121; TE 221, 222, 325, 421; ACF 211; MT 331, 332; MN 310, 415; ANT 206; EH 415. Courses or a sequence in any other department may be used to build strength for a selected profession on prior approval of the adviser.

Free Electives (14 hours) to be selected.

Textile Design Option (CTD) — Required Courses - 50-52 hours

CA 216 Art for Living II.....	3-5	CA 576B Adv. Print., Dye.: Block Print.....	3
CA 313 Home Furnishings.....	5	CA 576C Adv. Print., Dye.: Screen Print.....	3
CA 385 Creative Weaving.....	3	CA 586 Rug Weaving.....	5
CA 515 History of Textiles.....	5	CA 587 Adv. Pat. Weaving.....	5
CA 575 Creative Textile Design.....	5	CA 588 Experimental Weaving.....	5
CA 576A Adv. Print., Dye.: Discharge and Resist. Print.....	3	AT 112 or 121 Fundamentals.....	5

*These courses must be completed by the end of the junior year.

Approved Professional Electives - 43-45 hours to be selected from among:

AT 111, 112, 113, 121, 122, 123; *CA 205, *226, 303, 343, 345, 375, 395, 465, 466, *490, *525, *535, *580; *TE 221, *222, *421.

*These courses strongly suggested.

Free Electives (14 hours) to be selected.

Textile Science Option (CTT) — Required Courses - 43 hours

BY 201 Microbes and Modern Man.....	5	CA 515 History of Textiles.....	5
BY 501 Biological Statistics.....	5	CA 535 Textile Testing.....	5
CH 208 Organic Chemistry.....	3	CA 560 Textile Finishes.....	4
CH 208L Organic Chemistry Lab.....	2	CA 560L Textile Finishes Lab.....	1
PS 200 or 205 Physics.....	5	CA 583 Soiling & Det. of Textiles.....	5
CA 385 Creative Weaving.....	3		

Approved Professional Electives - 50 hours to be selected from among:

CA 313, 342, 490, 575; CH 105, 105L, 204, 204L, 209, 316, 515, 516; MH 161, 162, 163; PS 206; TE 232, 241, 242.

Free Electives (16 hours) to be selected.

TOTAL—205 QUARTER HOURS

Students with other specialized professional goals in Clothing, Textiles, and Related Art should plan an appropriate coordinated program of electives to provide needed knowledge and competence.

Students interested in combining Clothing and Textiles with teacher certification, consult adviser for specific course requirements.

All electives must be approved by the student's adviser.

Consumer and Family Economics (CFE)

The curriculum in Consumer and Family Economics prepares students for professional positions that deal primarily with the economic problems of individuals and families. These include positions in the following areas: credit counseling in banks, housing authorities, social service agencies, and independent credit counseling services; consumer protection with local, state, and federal agencies; and business and industry.

Curriculum in Consumer and Family Economics (CFE)

FRESHMAN YEAR		
First Quarter		
MH 160	Pre-Cal W/Trig.....	5
CA 116	Art for Living I.....	3
EH 101	English Comp.....	3
FCD 157	Fam. & Human Dev.....	3
Second Quarter		
BI 101	Prin. of Biology.....	5
CA 113	Housing for Man.....	3
EH 102	English Comp.....	3
NF 112	Nutrition and Man.....	3
	Liberal Ed. Elective.....	3
Third Quarter		
BI 104	Bio. in Hum. Affairs.....	5
PG 211	Psychology.....	5
CA 115	Clothing & Man.....	3
EH 103	English Comp.....	3
SOPHOMORE YEAR		
First Quarter		
EC 200	Economics I*.....	5
HY 204	Tech. & Civ. I.....	3
SC 211	Public Speaking.....	5
	Hum/Fine Arts*.....	5
Second Quarter		
EC 202	Economics II*.....	5
SY 201	Intr. to Soc.....	5
HY 205	Tech. & Civ. II.....	3
	Prof. Elective.....	5
Third Quarter		
FCD 270	Family II.....	4
HY 206	Tech. & Civ. III.....	3
	Prof. Elective.....	5
	Math/Nat. Sci.*.....	5
JUNIOR YEAR		
First Quarter		
CA 233	Home Equip. I.....	5
MT 255	Leg. Soc. Env. Bus.....	4
CA 323	Man the Consumer.....	3
EHA 315	Bus. Prof. Writ.....	3
	Elective.....	3
Second Quarter		
MN 310	Prin. of Mgt.....	4
MT 331	Prin. of Mkt.....	5
CA 398	Professional Planning.....	1
	and Development.....	1
	Prof. Elective.....	5
	Elective.....	3
Third Quarter		
EC 551	Intr. Microecon.....	5
CA 553	Cons. & the Market.....	3
CA 570	Alloc. Fam. Resources.....	3
CA 431	Man-Environ. Rel.....	2
MT 341	Cons. Behavior.....	5
SENIOR YEAR		
First Quarter		
CA 514	Soc. Prob. of Housing.....	5
CA 541	Fam. Finan. Mgt.....	5
	Elective.....	3
	Prof. Elective.....	5
Second Quarter		
CA 528	Cons. Economics.....	5
	Prof. Electives.....	9
	Elective.....	3
Third Quarter		
CA 530	Cons/Fam. Econ. Issues.....	3
CA 336	Field Exp. in CA.....	10
	Prof. Electives.....	3

TOTAL—205 QUARTER HOURS

*A maximum of 51 credit hours, excluding EC 200, 202, and ACF 340, is allowed from the School of Business.

**Liberal Education Electives.

APPROVED PROFESSIONAL ELECTIVES

Sixteen hours should be chosen from CA 205, 303, 343, 355, 443, 533, 538; FCD 306, 310, 477, 568; NF 104, 204, 358.

Twenty hours should be chosen from ACF 211, 212, 314, 320; EC 340, 350, 360, 433, 552, 554, 555, 556; EH 415; JM 315; MT 436; RSY 362, 541, 561, 562; SC 204; SY 220, 370, 501; SW 375, 575.

Family Resource Management (FRM)

The Family Resource Management major is designed for students interested in a broad general education in home economics. Professional preparation is offered for positions in Cooperative Extension Service, home service and other areas of business requiring a background in home management and social science.

Curriculum in Family Resource Management (FRM)

FRESHMAN YEAR		
First Quarter		
MH 160	Pre Cal. w/Trig.....	5
CA 116	Art for Liv. I.....	3
EH 101	English Comp.....	3
NF 112	Nutr. & Man.....	3
Second Quarter		
BI 101	Prin. Bio.....	5
NF 104	Prin. Food Prep.....	5
CA 115	Cloth. & Man.....	3
EH 102	English Comp.....	3
Third Quarter		
BI 104	Bio. Hum. Affairs.....	5
CA 105	Fund. Cloth.....	5
EH 103	English Comp.....	3
FCD 157	Fam. & Hum. Dev.....	3
SOPHOMORE YEAR		
First Quarter		
EC 200	Econ. I*.....	5
SY 201	Intr. to Soc.....	5
CA 113	Housing for Man.....	3
HY 204	Tech. & Civ. I.....	3
EHA 315	Bus. Prof. Writing.....	3
Second Quarter		
EC 202	Econ. II*.....	5
NF 204	Meal Mgt.....	5
PG 211	Psychology.....	5
HY 205	Tech. & Civ. II.....	3
Third Quarter		
PS 200	Fnd. of Physics.....	5
FCD 267	Human Dev. I.....	4
FCD 270	Family II.....	4
HY 206	Tech. & Civ. III.....	3

First Quarter			JUNIOR YEAR			Third Quarter		
CA 233	Home Equip. I.....	5	MT 331	Prin. of Mkt.....	5	MN 310	Prin. of Mgt.....	4
SC 211	Public Speaking.....	5	CA 355	Cons. Textiles.....	3	MT 255	Leg. Soc. Env.....	4
CA 323	Man the Consumer.....	3	CA 398	Professional Planning and Development.....	1		Bus.....	4
	Elective.....	3		Liberal Ed. Elective.....	5		Prof. Elective.....	8
				Elective.....	3		Liberal Ed. Elective.....	3
			SENIOR YEAR					
CA 541	Fam. Finance Mgt.....	5	CA 528	Cons. Economics.....	5	CA 523	Home Equipment II.....	5
	Liberal Ed. Elective.....	5	CA 443	Fam. Resource Mgt.....	5	CA 570	Alloc. Fam. Resources.....	3
	Elective.....	5		Resid.....	5		Prof. Electives.....	4
	Prof. Elective.....	4	CA 553	Cons. & the Market.....	3	CA 530	Cons./Fam.....	3
			CA 431	Man-Environ. Rel.....	2		Econ. Issues.....	3
				Liberal Ed. Elective.....	5			

TOTAL—205 QUARTER HOURS

*A maximum of 51 credit hours, excluding EC 200, 202, and ACF 340, is allowed from the School of Business.

APPROVED PROFESSIONAL ELECTIVES

Choose 20 hours from the following: CA 205, 303, 333, 336, 343, 511, 514, 538; NF 312, 358, 362; FCD 269, 477; EC 340, 360; EH 415; JM 315; MT 341; RSY 382, 541; SC 204; SW 375, 575.

Fashion Merchandising (FM)

Fashion Merchandising prepares majors for such positions as buyer or assistant buyer, comparison shopper, fashion stylist or coordinator, merchandise manager, fashion promoter, or a store owner-manager. Ten weeks of retail training is included in the fashion merchandising curriculum.

Curriculum in Fashion Merchandising (FM)

First Quarter			FRESHMAN YEAR			Third Quarter		
MH 140	College Algebra.....	5	CH 103	Fund. of Chem. I.....	4	CH 104	Fund. of Chem. II.....	4
CA 116	Art for Liv. I.....	3	CH 103L	Gen. Chem. Lab.....	1	CH 104L	Gen. Chem. Lab.....	1
CA 116L	Art for Liv. Lab.....	2	CA 115	Clothing & Man.....	3	EH 103	English Comp.....	3
EH 101	English Comp.....	3	EH 102	English Comp.....	3	FCD 157	Fam. & Human Dev.....	3
	HY/AT*.....	3		HY/AT*.....	3		HY/AT*.....	3
				Liberal Ed. Elective.....	3	NF 112	Nutrition & Man.....	3
			SOPHOMORE YEAR					
CH 203	Org. Chem.....	5	CA 105	Fund. of Clothing.....	5	CA 225	Textiles.....	5
EC 200	Economics I.....	5	EC 202	Economics II.....	5	ACF 211	Prin. of Acc. I.....	4
PG 211	Psychology.....	5	SY 201	Intr. to Soc.....	5	SC 202	App. Sp. Comm.....	3
CA 205	Cloth. Cons. & Sel.....	3	CA 113	Housing for Man.....	3		Electives.....	5

*Students may take any combination of World History, HY 101-102-103; Tech. and Civilization, HY 204-205-206; History of World Art, AT 171-172-173.

			JUNIOR YEAR					
MT 332	Mkt. Comm. Mgt.**.....	5	CA 316	Fash. Analysis.....	5	CA 325	Fashion Merch.....	5
CA 226	Fash. Sketch.....	3	CA 323	Man the Consumer.....	3		Prof. Electives*.....	8
JM 315	Tech. Journ.....	3	MT 333	Merch. Mgt.**.....	5		Electives.....	3
MT 331	Prin. of Mkt.**.....	5	CA 334	Intr. to Fid. Exp.....	2			
EH	***.....	3	CA 398	Professional Planning and Development.....	1			
				Electives.....	3			
			SENIOR YEAR					
CA 335	Retail Training.....	13	CA 516	Apparel Qual. Eval.....	5	CA 525	History of Cost.....	5
			CA 535	Textile Testing.....	5	CA 431	Man-Env. Rel.....	2
				Prof. Electives*.....	8		Prof. Electives*.....	10

TOTAL—205 QUARTER HOURS

*Professional Electives—8 of the 13 hours selected from among CA 205, 385, 395, 511, 521, 523, 524, 538, 556, 575, 583; any CA courses. 13 hours from EC 206, 274; MN 310, 346, 442; ACF 212; MT 241, 242, 436, 437, 440; SY 505; or any justifiable courses.

**A maximum of 51 credit hours, excluding EC 200, 202, and ACF 340, is allowed for credit from the School of Business.

***Students may choose one course from English Lit., EH 253, or Sur. Lit. Western World, EH 260-261-262.

One-year Transfer Programs

Qualified students in the Clothing, Textile Design, or Fashion Merchandising curricula may apply for one of several one-year transfer programs to be taken during the junior year. Transfer Programs are planned with an adviser so that transfer credits meet Auburn curriculum requirements while the student earns an Associate Degree from the transfer institution.

Programs are available with the Fashion Institute of Technology in New York in clothing and textile design and merchandising. Apparel Engineering is available in cooperation with Southern Technical Institute in Marietta, Ga.

For further information, contact the Head of the Consumer Affairs Department.

One-quarter Internship Programs

Students majoring in Fashion Merchandising or Interior Furnishings and Equipment are required to arrange an internship or field experience away from campus during one quarter of the junior or senior year. However, such experiences can be arranged for students in any Consumer Affairs major. To earn credit, internship site and work-study program must be approved by the student's adviser.

Housing (HS)

Graduates of the program will fill the growing need for professionals such as housing community service director, housing educator, consultant, counselor, public housing manager, or extension worker.

Curriculum in Housing (HS)

FRESHMAN YEAR

First Quarter		Second Quarter		Third Quarter	
BI	101 Prin. of Biology.....5	BI	104 Bio. in Human Affairs...5	SY	201 Intr. to Soc. or.....5
MH	160 Pre-Cal. w/Trig.....5	PG	211 Psychology.....5	RSY	261 Rural Soc. ....5
CA	113 Housing for Man.....3	CA	115 Clothing & Man.....3	CA	118 Art for Living I.....3
EH	101 English Comp.....3	EH	102 English Comp.....3	CA	118L Art for Living Lab.....2
		NF	112 Nutrition & Man.....3	EH	103 English Comp.....3
				FCD	157 Fam. & Human Dev.....3

SOPHOMORE YEAR

CA	233 Home Equipment I.....5	BSC	202 Materials of Const.....5	EC	200 Economics I**.....5
MT	241 Business Law I**.....4	CA	303 The House.....5	RSY	362 Comm. Org. ....5
CA	323 Man the Consumer.....3	SY	220 Statistics.....5	EH	315 B & P Rept. Writing.....3
HY	204 Tech. & Civ. I.....3	HY	205 Tech. & Civ. II.....3	HY	206 Tech. & Civ. III.....3
	Liberal Ed. Elective.....3			SC	202 App. Speech Comm.....3

JUNIOR YEAR

CA	514 Soc. Prob. of Hous.....5	MT	331 Prin. of Mkt.**.....5	PO	323 Mun. Govt. ....5
EC	202 Economics**.....5	CA	398 Professional Planning.....1	CA	553 Cons. & the Mkt.....3
CA	431 Man-Environ. Rel.....2		and Development.....1		Elective.....5
			Math/Nat. Sci. ....5		Prof. Elective.....5
			Prof. Elective.....5		
			Elective.....3		

SENIOR YEAR

CA	541 Fam. Fin. Mgt.....5	AEC	509 Resource Econ.....5	CA	336 or Prof. Electives.....15
SY	505 Urban Sociology.....5	CA	530 Cons./Fam. Econ.....3		
	Prof. Elective.....7		Issues.....3		
			Electives.....5		

TOTAL—205 QUARTER HOURS

*Liberal Education Electives

**A maximum of 51 credit hours, excluding EC 200, 202, and ACF 340, is allowed from the School of Business.

APPROVED PROFESSIONAL ELECTIVES

An internship (CA 336) may be used in partial fulfillment of professional electives.

Minimum of 10 hours selected from: FCD 267, 269, 306, 310; NF 358; SW 375; SY 202, 204, 310, 370, 409, 501, 520.

Minimum of 10 hours selected from: ACF 211, 323; EC 206, 360, 559; MN 310; MT 242; RP 474, 524, 525, 527, 530, 545, 575.

Minimum of 10 hours selected from: BSC 101, 261-262; AR 360, 370, 474; CA 313, 333, 343, 355, 533; HF 221; IE 308; U 210.

Interior Furnishings and Equipment (IFE)

Professional opportunities for graduates in Interior Furnishings and Equipment include designing, merchandising, and consumer consulting positions with retailers, manufacturers, public utilities, cooperative extension, and some government agencies.

Curriculum in Interior Furnishings and Equipment (IFE)

First Quarter			FRESHMAN YEAR			Third Quarter		
MH 140	College Algebra	5	CH 103	Fund. of Chemistry I	4	CH 104	Fund. of Chemistry II	4
CA 116	Art for Living I	3	CH 103L	Gen. Chemistry Lab.	1	CH 104L	Gen. Chemistry Lab.	1
CA 116L	Art for Living Lab.	2	CA 115	Clothing & Man	3	SC 211	Public Speaking	5
EH 101	English Comp.	3	CA 113	Housing for Man	3	AT*		3
NF 112	Nutrition & Man	3	EH 102	English Comp.	3	EH 103	English Comp.	3
			HY*		3			
			SOPHOMORE YEAR					
PS 200	Fnds. of Physics	5	CH 203	Organic Chemistry	5	BY 201	Microbio. & Mod. Man	5
PG 211	Psychology	5	CA 233	Home Equip. I	5	CA 225	Textiles	5
EC 200	Economics I	5	EC 202	Economics II	5	AT 111	Art Fund.	5
EH 260,	261, or 262		FCD 157	Fam. & Human Dev.	3		Prof. Elective	3
	World Lit.	3						
			JUNIOR YEAR					
CA 303	The House	5	CA 333	Lighting Design	5	CA 533	Home Equip. II	5
CA 313	Home Furnishings	5	SY 201	Intr. to Sociol.	5	CA 343	Interior Home Prob.	5
MT 331	Prin. of Mkt.	5	CA 398	Professional Planning			Elective	5
CA 323	Man the Consumer	3		and Development	1		Prof. Elective	3
				Elective	4			
				Prof. Elective	3			
			SENIOR YEAR					
CA 473	Contemp. Home Furn.	3	CA 336	Field Exp.	5-15	CA 553	Cons. & the Mkt.	3
EHA 415	Writ. Bus. Comm.	3		Prof. Electives	0-10	CA 431	Man-Environ. Rel.	2
	Prof. Electives	9					Prof. Electives	10
	Liberal Ed. Elec.	3						

TOTAL—205 QUARTER HOURS

*Students may take any combination of World History: HY 101-102-103; Tech. and Civilization, HY 204-205-206; Art History, AT 171-172-173.

**Students who take a 15 credit field experience, take the reduced number of professional electives.

APPROVED PROFESSIONAL ELECTIVES

Minimum of 10 hours selected from: ACF 211, 323; CA 325, 514, 528, 530, 535, 541, 583; MN 310, 346; MT 241, 242, 332, 333, 337, 341; EC 555; SY 411; JM 315; NF 104; EHA 315.

Minimum of 10 hours selected from: BSC 202; AR 360, 370; AT 112, 371-379; ID 365, 366, 367; U 210, CA 216, 375, 385, 515, 575, 586; HF 221.

Department of Family and Child Development

The Department of Family and Child Development is concerned with the processes of growth and development of the individual in his daily living from infancy to old age and with the creation of techniques for facilitating such development. Its primary mission is the promotion of self-fulfillment of individuals and families through maximum utilization of material and human resources.

Two curricula, including four options, are offered in this department: Family and Child Development (General Family and Child Development, Day Care and Programs for Young Children) and Family and Child Services (Comprehensive Family and Child Services and Family Services-Aging).

General Studies Requirements

EH 101- 102-103 English Comp.	9	CA 323 Man the Consumer	3
SC 273 Gr. Prob. Solving	5	CA 398 Professional Planning & Development	1
HY 101- 102-103 World History	9	CA 431 Man-Environment Relations	2
SY 201 Sociology	5	NF 112 Nutrition and Man	3
PG 211 Psychology I		FCD 157 Fam. & Hum. Dev.	3
or		FCD 267 Hum. Dev. I	4
PG 213 Affect. Behav. or Pers. Adjust.	5	FCD 269 Family I	4
EC 200 Economics I	5	FCD 270 Family II	4
BI 101 Biology	5	FCD 280 Hum. Dev. II**	4
CA 113 Housing for Man	3	FCD 301 Hum. Dev. III	5
CA 115 Clothing and Man	3	FCD 302 Hum. Dev. IV	4
CA 116 Art for Living I	3	FCD 306 Family III	4
Mathematics or Philosophy*	5	FCD 477 Hum. Dev. V***	3

*FCSA majors take MH 140.

**FCSA majors are not required to take FCD 280.

***FCDD majors are not required to take FCD 477.

Areas of Professional Specialization

Curriculum in Family and Child Development

Major in General Family and Child Development (FCD)

Required Courses - 16 hours

FCD 300 Appro. Child Study	4	FCD 420 Recent Resch. in Child Dev.	4
FCD 347 Lab. Exper. with Yng. Child.	3	BI 104 Bio. of Hum. Affairs	5

Electives - 88 hours

Professional	37
Liberal Education	18
General	33

TOTAL—205 QUARTER HOURS

Option in Day Care and Programs for Young Children (FCDD)

Required Courses - 57-57 hours

ZY 105 Intr. to Hum. Physiol.	5	FCD 467 Parent Education	4
FCD 300 Appro. Child Study	4	FCD 547 Admin. Prog. for Yng. Child.	3
FCD 347 Lab. Exper. with Yng. Child.	3	FCD 497D Dir. Fid. Exp.: Day Care	5-15
FCD 350 Day Care for Child.	4	NF 312 Child Nutrition	3
FCD 358 Learn. Exper. for Yng. Child.	4	PG 350 Behav. Mod. in Early Childhd.	5
FCD 359 Pract. in Preschool Teach.	3	RSE 561 Excep. Child in the Classroom	5
FCD 420 Recent Resch. in Child Dev.	4	EM 510 Media for Children	5

Electives - 40-50 hours

Professional	17-27
Liberal Education	18
General	5

TOTAL—205 QUARTER HOURS

Curriculum in Family and Child Services

Major in Comprehensive Family and Child Services (FCS)

Required Courses - 65-75 hours

BI 104 Biology of Human Affairs	5	SY 308 Juvenile Delinquency	5
FCD 300 Appro. Child Study	4	SW 375 Intr. to Social Work	5
FCD 306 Fam. & Child Mental Health	4	PG 315 Quantitative Methods	5
FCD 310 Tech. of Interviewing	4	PG 330 Soc. Psych.	4
FCD 347 Lab. Exp. for Yng. Child.	3	PO 210 Amer. State & Local Govt.	5
FCD 420 Recent Resch. in Child Dev.	4	PO 325 Public Admin.	5
FCD 487 Intr. to Fid. Exper. and Careers	2	RSY 362 Community Organ.	5
FCD 497A Dir. Fid. Exp.: Soc. Serv.	5-15		

Electives - 29-39 hours

Professional	0-10
Liberal Education	13
General	16

TOTAL—205 QUARTER HOURS

Option in Family Services - Aging Studies (FCSA)

Required Courses - 64 hours

BI 103	Animal Biology	5	SY 477	Soc. of Aging	3
FCD 310	Tech. of Interviewing	4	FCD 497F	Dir. Fid. Exp.: Aging	5
FCD 487	Intr. to Fid. Exper. and Careers	2	FCD 499	Sem.: Prob. Work. Old. Adults	2
FCD 497A	Dir. Fid. Exp.: Soc. Serv.	5-15	PG 507	Maturity and Aging	5
SW 375	Intr. to Social Work	5	PG 330	Social Psych.	4
PG 302	Psych. of Death and Dying	3	PO 210	Amer. State & Local Govt.	5
ZY 360	Phys. of Aging	3	PO 325	Public Admin.	5
RSY 371	Resch. Meth. and Prog. Eval.	3	RSY 362	Community Organ.	5

Electives - 44 hours

Professional	12
Liberal Education	13
General	19

TOTAL—205 QUARTER HOURS

Department of Nutrition and Foods

The Nutrition and Foods major is designed for students having a strong interest in the health, physical growth, and welfare of people, and the ability to apply scientific principles to the solution of problems. The sociological, psychological, physiological, and economic aspects of food in nutritional status are integral parts of the program.

The department, through its majors in Coordinated Dietetics, Nutrition and Foods, and Food Service Administration, prepares students for teaching, research, and health service careers in educational institutions, hospitals, industry, and government.

Food Service Administration (FSA)

The Food Service Administration major prepares students to manage food service operations.

Curriculum in Food Service Administration (FSA)

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
MH 140	College Algebra or		NF 104	Prin. of Food Prep.	5	NF 204	Meal Mgt.	5
MH 160	Pre-Cal. w/Trig.	5	CH 103	Fund. of Chem. I	4	CH 104	Fund. of Chem. II	4
EH 101	English Comp.	3	CH 103L	Gen. Chemistry Lab.	1	CH 104L	Gen. Chemistry Lab.	1
HY 101	World History*	3	EH 102	English Comp.	3	EH 103	English Comp.	3
NF 112	Nutrition & Man.	3	HY 102	World History*	3	HY 103	World History*	3

SOPHOMORE YEAR

CH 203	Organic Chemistry	5	BI 101	Prin. of Biology	5	EC 202	Economics II**	5
PG 211	Psychology	5	EC 200	Economics I**	5	SC 211	Fund. Speech Comm.	5
ACF 211	Prin. of Acc. I***	4	SY 201	Intr. of Soc.	5	ZY 105	Intr. Human Physiology	5
EH	Literature Elective	3	EHA 304	Tech. Writing or			Elective	3
			JM 315	Tech. Journalism	3			

JUNIOR YEAR

MN 310	Prin. of Mgt.	4	NF 564	Experimental Foods	5	EC 350	Labor Economics***	5
BY 300	Gen. Microbio	5	MT 241	Business Law I**	4	MT 331	Prin. of Mkt.	5
	Prof. Electives**	5	ADS 415	Food Plant San.	3		Prof. Elective**	5
	Elective	4	CA 398	Professional Planning and Development	1		Elective	3
				Prof. Elective**	5			

SENIOR YEAR

MT 332	Mkt. Comm. Mgt.	5	MT 341	Consumer Behavior	5	NF 346	Food Ser. Org. & Mgt.	5
NF 404	Quant. Food Prep.	5	VED 513	Nature of Adult Ed.	4		Elective	8
CA 431	Man-Environ. Relat.	2		Prof. Elective**	5		Liberal Ed. Elective	5
	Prof. Elective**	5		Elective	4			

TOTAL—205 QUARTER HOURS

*Any combination of World History, HY 101-102-103; Technology and Civilization; HY 204-205-206; History of Art, AT 171-172-173; or Western World Literature, EH 260-261-262, may be taken.

**To qualify for ADA membership through therapeutic and administrative dietetics, students will be required to take the courses marked ** or the list of suggested professional electives.

***A maximum of 51 credit hours, excluding EC 200, 203, and ACF 340, is allowed from School of Business.

Nutrition and Foods (NF)

Major areas of concentration in Nutrition and Foods include dietetics, nutrition, and experimental foods with minors in food science, teaching, chemistry, biology, journalism, radio and television, and others from which a student may select.

Curriculum in Nutrition and Foods (NF)

FRESHMAN YEAR

First Quarter		Second Quarter		Third Quarter	
MH 140	College Algebra or	NF 104	Prin. of Food Prep.....5	CH 104	Fund. of Chem. II.....4
MH 160	Pre-Cal. w/Trig.....5	CH 103	Fund. of Chem. I.....4	CH 104L	Gen. Chem. Lab.....1
BI 101	Prin. of Biology.....5	CH 103L	Gen. Chem. Lab.....1	CA 115	Clothing & Man.....3
EH 101	English Comp.....3	EH 102	English Comp.....3	EH 103	English Comp.....3
HY 101	World History.....3	HY 102	World History.....3	HY 103	World History.....3
				NF 112	Nutrition & Man.....3

SOPHOMORE YEAR

CH 203	Organic Chem.....5	EC 200	Economics I.....5	SC 211	Public Speaking.....5
PG 211	Psychology.....5	NF 204	Meal Mgt.....5	ZY 251	Physiology.....5
SY 201	Intr. to Soc.....5	BY 103	Animal Biol. or	CA 116	Art for Liv. I.....3
CA 113	Housing for Man.....3	ZY 250	Human Anatomy.....5	FCD 157	Family & Hum. Dev.....3
			Lit. Electives.....3		

JUNIOR YEAR

NF 404	Quant. Food Prep.....5	BY 300	Gen. Microbio.....5	NF 346	Food Service Org. & Mgt.....5
NF 318	Nutri. Biochem.....5	NF 382	Prin. of Normal Nutrition I.....5	NF 392	Prin. of Normal Nutrition II.....5
MN 310	Prin. Mgt.....4	SY 220	Statistics.....5	VED 466	Teaching Out of School Groups.....3
CA 323	Man the Consumer.....3	CA 398	Professional Planning and Development.....1		Prof. Electives*.....4
			Prof. Elective*.....3		

SENIOR YEAR

EH 301	Creative Writing or	NF 564	Experimental Foods.....5	CA 431	Man-Environ. Rel.....2
EHA 304	Tech. Writing or		Prof. Electives*.....6		Prof. Electives*.....8
JM 315	Tech. Journalism.....3		Electives.....7		Liberal Ed. Elective.....5
	Prof. Electives*.....8				
	Elective.....7				

TOTAL—205 QUARTER HOURS

*A maximum of 51 credit hours, excluding EC 200, 202, and ACF 340, is allowed from School of Business.

Special areas of interest in Nutrition, Dietetics, Food Science, Communication in Food & Nutrition, Research, and Teacher Education may be developed through choice of elective courses.

NUTRITION AND FOODS OPTIONS—PROFESSIONAL ELECTIVES

A. General Dietetics		C. Management in Dietetics	
ANT 203	Intr. Anthro*.....5	ACF 211, 212	Accounting.....4, 4
IE 580	Data Proc. Fund.....5	EC 202	Economics II*.....5
NF 502	Diet Therapy*.....5	EC 350	Labor Econ*.....5
NF 408	Independent Study.....3-8	MN 442	Personnel Mgt.....5
		IE 580	Data Proc. Fund.....5
B. Community Nutrition		NF 408	Independent Study.....3-8
ANT 203	Intr. Anthro*.....5	D. Therapeutic & Clinical Dietetics	
NF 358	Comm. & Fam. Health*.....3	ANT 203	Intr. Anthro*.....5
NF 502	Diet Therapy*.....5	ZY 524	An. Physiol.*.....5
NF 408	Independent Study*.....3-8	NF 502	Diet Therapy*.....5
NF 362	Prob. Comm. Nutr.*.....3	NF 408	Independent Study.....3-8

*ADA Requirements.

Coordinated Dietetics Program (CDP)

Upon completion of this program incorporating clinical experiences with classroom teaching, the student is eligible for Registration as a Dietitian by the American Dietetic Association.

Curriculum in the Coordinated Dietetics Program (CDP)

First Quarter			FRESHMAN YEAR			Third Quarter		
			Second Quarter					
MH 140	College Algebra or		NF 104	Prin. of Food Prep.....5		CH 104	Fund. of Chem. I.....4	
MH 160	Pre-Cal. w/Trig.....5		CH 103	Fund. of Chem. I.....4		CH 104L	Gen. Chem. Lab.....1	
CA 113	Housing for Man.....3		CH 103L	Gen. Chem. Lab.....1		CA 116	Art for Living I.....3	
EH 101	English Comp.....3		EH 102	English Comp.....3		CA 115	Clothing & Man.....3	
HY 101	World History.....3		HY 102	World History.....3		EH 103	English Comp.....3	
NF 112	Nutrition & Man.....3			Liberal Ed. Elective.....2		HY 103	World History.....3	
			SOPHOMORE YEAR					
BI 101	Prin. of Biol.....5		BI 103	Animal Biol.....5		PG 211	Psychology.....5	
CH 203	Organic Chem.....5		BY 300	Gen. Microbiology.....5		SY 201	Intr. to Soc.....5	
EC 200	Economics I.....5		NF 204	Meal Mgt.....5		ZY 251	Physiology.....5	
FCD 157	Family & Human Dev.....3		EH	Lit. Elective.....3		MN 310	Prin. of Mgt.....4	
			JUNIOR YEAR					
NF 564	Experimental Foods.....5		NF 516	Quant. Food Prep.....10		NF 356	Food Ser. Admin.....10	
NF 318	Nutr. Biochem.....5		NF 382	Prin. of Normal Nutrition I.....5		NF 392	Prin. of Normal Nutrition II.....5	
CA 323	Man the Consumer.....3		CA 398	Professional Planning and Development.....1		VED 466	Tch. Out-of-School Groups.....3	
NF 307	Survey of Dietetics.....2							
			SENIOR YEAR					
NF 432	Med. Dietetics.....10		NF 522	Comm. Nutrition.....10		NF 442	Advanced Dietetics.....15	
NF 592	Nutr. in Life Cycle.....5		CA 431	Man-Environ. Rel. Elective.....4				
	Liberal Ed. Elective.....3							

TOTAL—205 QUARTER HOURS

*HY 204-205-206 Tech. & Civil.; EH 260-261-262, Western World Literature; or AT 171-172-173, History of Art may be substituted for HY 101-102-103.

Dual Objective Program with the School of Education

Dual objective programs with the School of Education (see p. 136) are open to students registered in the School of Home Economics in the following five majors:

Family and Child Development
Clothing, Textiles and Related Art
Nutrition and Foods

Family Resource Management
Family Economics
Interior Furnishings and Equipment
Housing

Option in Cooperative Extension

Students enrolled in any of the majors in the School may prepare for a career in the Cooperative Extension Service through selection of certain courses as electives. The major of Family Resource Management meets the requirements of this option. Other majors may also fulfill the requirements of the Cooperative Extension Service through scheduling of the following courses:

NF-104, 112, 204, 324, 362
CA-105, 206, 233, 343, 225 or 355, 541, 570
FCD-267, 467
EM-200

GRADUATE WORK

The School offers work leading to the Master of Science degree, Master of Arts in College Teaching degree, and the Ph.D. degree in Experimental Nutrition, an inter-departmental program.

School of Nursing

MARY F. WOODY, *Dean*

THE SCHOOL OF NURSING, established in 1978-79, offers a program of preparation leading to the degree of Bachelor of Science in Nursing.

The nursing curriculum is designed to prepare the beginning professional nurse as a generalist ready to assume responsibility as a member of the health-care team in providing care for individuals and groups. Employment opportunities for registered nurses are available in a variety of settings. The program is planned to provide an educational base which allows for advancement in formal study, research, and practice. The facilities and resources of the University are utilized to provide a broad academic background in the humanities and sciences.

The Program

The four-year program of study leads to the degree of Bachelor of Science in Nursing. Graduates are eligible to take the State Board Test Pool examination to become a registered nurse.

A pre-professional program in Nursing Science is required of all students seeking admission to the professional curriculum. The first two years of course work are designated as Pre-Nursing (NS). The professional program (NUR) requires seven quarters of course work, laboratory and clinical experience.

Curriculum in Pre-Nursing Science (NS)

FRESHMAN YEAR					
First Quarter			Second Quarter		
EH 101	English Comp.....	3	EH 102	English Comp.....	3
HY 101	World History.....	3	HY 102	World History.....	3
CH 103	Fund. Chem & Lab.....	5	CH 104	Fund. of Chem. II.....	5
MH 140	College Algebra or			Elective*.....	5
MH 180	Pre. Cal. w/Trig.....	5			
			Third Quarter		
EH 103	English Comp.....	3	EH 103	English Comp.....	3
HY 103	World History.....	3	HY 103	World History.....	3
SY 201	Intr. to Soc.....	5	SY 201	Intr. to Soc.....	5
BI 101	Prin. of Biology.....	5	BI 101	Prin. of Biology.....	5
PE	Physical Education.....	1	PE	Physical Education.....	1
SOPHOMORE YEAR					
BI 103	Animal Biology or		ZY 251	Physiology.....	5
ZY 250	Anatomy.....	5	CH 203	Organic Chemistry.....	5
PG 211	Psychology.....	5	PG 330	Exper. Psychology.....	5
ANT 203	Intr. to Ant.....	5	PG 531	or Social Psychology.....	5
EH	Literature Elective.....	3		Elective*.....	3
BY 302	Microbiology.....	5	BY 302	Microbiology.....	5
NF 372	Fund. of Nutrition.....	3	NF 372	Fund. of Nutrition.....	3
SY 301	Socio. of Family or.....	5	SY 301	Socio. of Family or.....	5
FCD 270	Family II.....	4	FCD 270	Family II.....	4
PA 218	Ethics/Health Sciences.....	5	PA 218	Ethics/Health Sciences.....	5

A minimum of 96 credits required for junior standing.

Curriculum in Professional Nursing (NUR)

JUNIOR YEAR					
First Quarter			Second Quarter		
NUR 301	Proc. Fund. to Nursing.....	10	NUR 311	Med. -Surg. Nursing.....	10
CED 422	Communication.....	4	NUR 380	Pharmacology in Nur.....	4
				Elective*.....	3
			Third Quarter		
			NUR 321	Maternity Nurs. or	
			NUR 331	Pediatric Nursing.....	10
			FCD 330	Life Span Human Dev.....	5
Fourth Quarter					
			NUR 331	Pediatric Nur. or	
			NUR 321	Maternity Nursing.....	10
			NUR 340	Directions in Nur.....	3
				Elective*.....	3

First Quarter		SENIOR YEAR		Third Quarter	
		Second Quarter			
NUR 412	Psychiatric/Mental Health Nur.....10	NUR 422	Comm. Health Nur.....10	NUR 442	Adv. Med.-Surg. Nur. ....7
SY 371	Meth. of Soc. Res.....3	NUR 482	Nur. Research.....3	NUR 495	Mgt. in Nur.....5
		NUR 450	Senior Seminar.....2		

A minimum of 204 credits required for graduation.

*Electives may be chosen from any field. Suggested areas pertinent to Nursing are: Family & Child Development, Communication, Sociology, Psychology, and Management.

Admission

Freshman eligibility for admission to the University is determined by the Admissions Office. Admission requirements are stated in the general information section of the Bulletin. High school preparatory courses in math (Algebra I and II and Plane Geometry) are required for admission to the pre-nursing curriculum. Students who do not have these courses will be admitted to the General Studies curriculum until a preparatory course is taken. High school chemistry and biology courses are strongly recommended, along with college preparatory courses in social science, history, literature and English composition.

Transfers from other institutions must apply through the Admissions Office for admission to the University. Review of transcripts will determine the amount of credit allowed for the pre-nursing requirements. Transfer credit is not allowed for clinical courses. Students planning to transfer are encouraged to contact the School of Nursing as soon as possible to insure maximum transferability of credits.

Registered nurses who meet the admissions criteria of the University may be admitted to the pre-nursing curriculum. The School of Nursing at present does not offer advanced standing in clinical courses. Plans are being developed to offer a clinical curriculum and advanced standing designed for registered nurses. Such a program will require the completion of all courses in the pre-nursing curriculum. The School of Nursing should be contacted for advisement.

All pre-nursing students must formally apply in February to the School of Nursing to be admitted to the professional part of the program. Criteria for admission include grade point average, completion of the pre-nursing requirements, references and an application with a statement of career goals. Admission to the professional program is open in the fall quarter only.

Meeting minimal requirements for admission does not necessarily guarantee acceptance into the professional program. The Admissions Committee considers, in addition to the above criteria, the general conduct, health and aptitude for nursing. Since enrollment in the clinical courses is limited, all students who qualify may not be admitted.

ACADEMIC REGULATIONS

An adviser from the faculty or staff is assigned to each student majoring in nursing. Academic program planning is done with the adviser.

Advanced standing (CLEP credit) in pre-nursing courses is granted in the humanities, English, and math according to University policies stated elsewhere in the Bulletin. No CLEP credit is allowed in the natural sciences by the School of Nursing.

An overall grade average of 2.0 must be maintained for progression through the program. Pre-nursing students who do not attain an overall grade average of at least 2.0 at the beginning of the second year should consider alternative fields of study. A minimum grade average of 2.5 is required for consideration for admission to the professional program.

A grade of "C" is required in courses in English, math, philosophy, the natural sciences, social sciences, and nutrition.

In the professional program of the School of Nursing, a minimal grade of "C" must be achieved in all courses except electives. If a grade less than "C" is received, the student may repeat the course one time only.

THE PROFESSIONAL PROGRAM

Facilities

The School of Nursing is housed in Miller Hall, where classrooms, a skills laboratory, a learning resource center, and faculty offices are located.

Clinical facilities for clinical nursing experiences include Lee County Hospital and other hospitals in the area, Lee County Mental Health Center, clinics, nursing homes, physicians' medical complex, Lee County Public Health Department, public schools and industrial sites.

Note: Students are responsible for complying with policies and procedures required by agencies in which clinical work is done.

Expenses

Additional expenses will be incurred by students accepted into the professional program. Uniforms, equipment, transportation to clinical sites, a health examination, and liability insurance coverage are among the requirements. Detailed information is furnished by the Dean's Office at the time of admission.

Accreditation

State: Provisional approval by the Alabama Board of Nursing has been granted. Full approval may be granted only after the graduation of the first class in June, 1981.

National: Application for accreditation by the National League for Nursing may be made only after the graduation of a class. The Auburn University School of Nursing is scheduled for an accreditation visit by representatives of the National League for Nursing in the Fall of 1981.



School of Pharmacy

BEN F. COOPER, *Dean*

THE SCHOOL OF PHARMACY offers a fully accredited program leading to the degree of Bachelor of Science in Pharmacy. The curriculum requires three years in the professional school after completion of two years in the pre-professional program.

The undergraduate degree in pharmacy is a necessary requisite for licensure for the practice of pharmacy in each of the 50 states and also the territories of the United States. In addition, completion of the program prepares students for careers in those areas of pharmacy not requiring licensure.

Pharmacists provide those personal health services that assure safety and efficacy in the procuring, storing, prescribing, compounding, dispensing, delivering, administering, and use of drugs and related articles. Among these services are maintenance of patient medication profiles, monitoring of drug therapy, counseling patients in matters of health, and providing health and drug information for nurses, physicians, and other health care practitioners.

Opportunities for graduates exist in community pharmacy, institutional pharmacy, industrial pharmacy (research, product development, analytical control, product manufacture, sales, and distribution), wholesale pharmacy, public health, health care funding agencies, and regulatory agencies. In addition, there are opportunities in research and teaching in an academic environment, after further education.

Admissions

The course requirements for admission to the School of Pharmacy may be satisfied by completion of the six quarter prepharmacy curriculum as outlined on page 92. Any or all of these requirements may be met by transfer of credit from other institutions. Transfer students from junior colleges may receive no more than 103 quarter hours credit for the prepharmacy curriculum.

Admission is limited and is contingent upon available facilities and faculty. To be considered for admission the applicant must have a satisfactory grade point average based on all courses attempted as well as a satisfactory science index (grade point average on the biological and physical science courses). A grade of D on any required course will not be accepted.

Students are accepted into the School of Pharmacy twice annually, Fall and Spring. Spring Quarter applications for the admission to the School of Pharmacy should be submitted not later than October 1, while Fall Quarter applications should be submitted not later than March 1. To be considered for admission to the School of Pharmacy, the applicant must forward to the Pharmacy Admissions Committee a completed application, a photograph, two interview report forms, two letters of recommendation, Pharmacy College Admissions Test scores (PCAT should be taken in November for Spring Admission and in February for Fall Admission), and complete transcripts of all work attempted, along with a list of courses in progress and courses planned before entrance into the pharmacy curriculum. Applicants must appear for a personal interview with the Pharmacy Admissions Committee upon request. Applicants will be notified as to acceptance or rejection no later than February 15, for Spring Admission and July 15, for Fall Admission.

If an applicant has not previously attended Auburn University, he/she must also be accepted by the Admissions Office before his/her application to the School of Pharmacy can be considered. For University applications write Admissions Office, Auburn University, Auburn, Alabama, 36849.

Any student in the pharmacy curriculum who is subjected to academic suspension and desires to re-enter the School of Pharmacy must, in addition to complying with the pertinent University regulation, be approved by the Pharmacy Admissions Committee for re-admission.

Guidelines to Academic Performance for Pharmacy Students

1. Grade point averages will be calculated from professional coursework only. *Professional coursework* is defined as those required and elective courses listed in the "Curriculum in Pharmacy" published in the current *Auburn University Bulletin*.
2. If an entering student does not maintain a GPA cumulative record of 2.0 for the 53 hours required in the first professional year, he or she will be required to retake "D" and "F" graded courses and will be denied entrance into 04PY courses until the 2.0 GPA is attained. In addition, students must maintain a 2.0 GPA in the 55 hours of 04PY courses in order to be eligible to register for PC459.
3. Upon receiving two failing grades ("F" or where appropriate "U") within a period of five consecutive enrollment quarters, whether the grades are received from the initial grade on a course, or from the retake of a previously failed course, the student will be suspended from the School of Pharmacy for two quarters. The student may appeal the suspension to the Professional and Academic Standards Committee of the School of Pharmacy in the event that significant extenuating circumstances exist.
4. Upon reinstatement from the first suspension, two additional "F" grades will result in a second suspension from the School of Pharmacy.
5. If a student is twice suspended, he or she may not re-enter the School of Pharmacy.
6. A student must receive passing credit in at least 12 hours of professional courses to receive one quarter of residency credit. A student receiving passing credit for 6-11 hours in professional courses will receive one-half quarter of residency credit.
7. A student must observe prerequisites and corequisites as stated in the current *AU Bulletin*.
8. All guidelines will be implemented in addition to University policies and standards existing.
9. A student desiring to retake a previously failed Pharmacy course must obtain consent of the appropriate Pharmacy School Department Head in order to retake the course.
10. A student may not add a course in the School of Pharmacy after five academic class days.
11. If a student drops a professional elective course after five academic class days, he or she will not be allowed to retake the course.

Curriculum Options

After the completion of the second professional year, students may choose a curriculum option which provides specialized knowledge in the areas of community pharmacy, institutional pharmacy, or graduate studies. Faculty advisers will provide guidance in the selection of curriculum options and the selection of appropriate courses of instruction within these options. Each of the options will adequately prepare students for licensure examinations.

Licensure Requirements

The Alabama State Board of Pharmacy (BOARD) controls (ACT205) the practice of pharmacy in the state. In brief the requirements for licensure are:

1. B.S. in Pharmacy degree from an accredited School of Pharmacy.
2. A total of 1,500 hours of practical experience under the supervision of a registered preceptor, 400 hours of which must be completed after graduation. A maximum of 400 hours of the 1,100 hours which can be earned prior to graduation may be completed while concurrently enrolled in pharmacy school.
3. Students are eligible to and should file an application with the BOARD for registration as an extern/intern at the time they enroll in the School of Pharmacy. Periods of any work experience should be reported to the Secretary of the Board within 10 days of beginning and within 10 days after ending the experience, or at intervals of 16 weeks, whichever first occurs.
4. Graduates of Schools of Pharmacy are eligible to take the theoretical portion of the BOARD examination anytime after graduation and are eligible to take the practical portion upon completion of the extern/intern requirements. Applications for taking the BOARD examinations may be picked up at the Office of the Dean anytime after graduation.
5. The Office of the Dean of the School of Pharmacy will be glad to respond to questions on licensure. Alternatively, request for information can be referred directly to: Mr. J. W. McLane, Secretary, Alabama State Board of Pharmacy, 2312 City Federal Building, Birmingham, Ala. 35203.

Continuing Education and Extension Services

Continuing education and extension service programs are available to pharmacists throughout the year. Faculty members of the School of Pharmacy, as well as practicing pharmacists and industry leaders, and consultants in state and federal governmental agencies, serve as instructors.

The Alabama Board of Pharmacy has adopted a regulation, effective January 1, 1980, which requires 15 clock hours of approved continuing education as a requirement for renewal of each pharmacist's controlled substances permit.

Curriculum In Pharmacy (PY)

FIRST PROFESSIONAL YEAR

First Quarter			Second Quarter			Third Quarter		
ZY	560	Mammalian Phys. I.....5	ZY	561	Mammalian Phys. II.....5	PC	347	Human Pathology.....5
CH	301	Biochemistry.....5	CH	302	Biochemistry.....5	BY	302	Med. Microbiol.....5
PY	301	Pharmaceutics I.....5	PY	302	Pharmaceutics II.....5	PC	346	Clin. Eval. Drug Ther.....3
		Elective*.....3	PCS	361	Drug Lit. Anal.....3	PY	316	Mod. Meth. Drug Anal.....4

First Quarter	
PY 420	Med. Chem. I .....5
PY 531	Pharmacology I .....5
PY 401	Pharmaceutics III.....5
PCS 471	Prof. Comm. I .....3

PC 457	Drug Interactions .....3
PCS 465	Phar. Oper. Sys. ....5
PCS 464	Jurisprudence.....5
PCS 360	Pharmacy Convoc.....0
PY 535	Toxicology .....5
or	
PC 449	Drug Therapy in Clinical Practice** .....5

SECOND PROFESSIONAL YEAR

Second Quarter	
PY 421	Med. Chem. II .....4
PY 532	Pharmacology II .....5
PY 432	Chem. Ph'col. Lab.....1
PC 447	Therapy of Disease I ....3
PCS 562	Intr. Med. Info. Syst.....3
PC 452	Drug Info. Orient.....2

THIRD PROFESSIONAL YEAR

PCS 360	Pharmacy Convoc.....0
PY 535	Toxicology .....5
or	
PC 449	Drug Therapy in Clinical Practice** .....5
	Prof. Electives*** .....13

Third Quarter	
PY 422	Med. Chem. III .....5
PY 533	Pharmacology III .....4
PY 433	Chem. Ph'col. Lab.....1
PC 448	Therapy of Disease II3
PC 403	Pharmaceutics IV3
	Prof. Elective3

PC 459	Externship18
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FOURTH PROFESSIONAL YEAR****

Clerkships.....	18
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Clerkships.....	18
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Clerkships.....	18
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*Elective Credit is restricted to courses offered by the Departments of Philosophy and Psychology.

**Drug Therapy in Clinical Practice and Toxicology must be selected during alternate quarters.

***Pharm. D. students must elect PY 402 Pharmacokinetics.

****A minimum of three quarters of Clinical Clerkships are required for the Pharm. D. degree.

TOTAL — 162 QUARTER HOURS (B.S.)

216 QUARTER HOURS (Pharm. D.)

NOTES:

1. Proficiency in typing is required for completion of PY 301.
2. Students must participate in field trips to a pharmaceutical manufacturing plant during their junior or senior year, and to a wholesale drug company during their senior year.
3. A set of Class C. metric and Apothecaries' weights, which may be purchased from Pharmacy Supply, is required for all Pharmacy laboratories.
4. Students will be required to spend one quarter of their third professional year in an off-campus, structured, externship experience.
5. Students enrolled in clinical or externship courses are required to furnish personal professional liability insurance.
6. All pharmacy elective courses are acceptable for option credit. Faculty advisers will provide information on any non-pharmacy elective courses which are acceptable.
7. Students who are qualified and have the prerequisites may take up to 10 hours of graduate courses in their fifth year; however, such work cannot be applied toward both the undergraduate and graduate degrees.

School of Veterinary Medicine

J. THOMAS VAUGHAN, *Dean*

H. C. MORGAN, *Associate Dean*

THE SCHOOL OF VETERINARY MEDICINE offers a fully accredited program of training leading to the degree of Doctor of Veterinary Medicine. The curriculum requires four years in the professional school after completion of a pre-professional course curriculum which now takes more than four years for the average applicant.

Admissions

Although the largest percentage of students admitted are residents of Alabama, some spaces are available for non-Alabama students. Most of these are by contract through the Southern Regional Education Board (SREB), but a limited number of non-Alabama students not under a contract program with Auburn University may be accepted. Individuals in this category must have a minimum grade-point average of 3.0 on a 4.0 scale, must possess exceptional qualifications and pay non-resident university fees. Alabama and SREB students must have a minimum grade-point average of 2.50 on a 4.00 system on all coursework attempted and on all required courses. A grade of D on any required course will not be accepted. In addition the Committee on Admissions and Standards of the School of Veterinary Medicine may require a personal interview, a reading comprehension test or an examination on any required course. The School of Arts and Sciences and the School of Agriculture offer Pre-Veterinary curricula and are responsible for pre-veterinary counseling. Although farm experience and work with veterinarians are not requirements for admission, applicants are urged to gain such training. Students without this experience frequently have difficulty with certain courses, particularly in the clinical areas.

Application for admission to either pre-veterinary curriculum should be made directly to the Admissions Office, Auburn University. Application for admission to the School of Veterinary Medicine, except for SREB students, should be made to the Chairman of Admissions, School of Veterinary Medicine, Auburn University, Al., 36849. SREB students must apply through their appropriate state agency.

Minimum Requirements for Pre-Veterinary Medicine

1. COMPLETION OF THE LIBERAL EDUCATION PROGRAM as stated on page 11 of this bulletin.

2. SPECIFIC COURSE REQUIREMENTS: Minimum pre-veterinary requirements for Alabama residents are exactly as listed for the pre-veterinary curriculum on page The program in the School of Agriculture has the same courses, but they are distributed over nine quarters. Non-Alabama and SREB applicants must have acceptable equivalents which have been approved by the School of Veterinary Medicine. Individuals taking the pre-veterinary curriculum are expected to declare an academic major prior to their 5th quarter of enrollment.

3. ALL TRANSFER COURSES must be equivalent in hours and content. CLEP substitutions are acceptable as stated in this catalog but only for mathematics and English. Courses will not be waived on the basis of degrees or "practical experience." Pass-Fail or Satisfactory-Unsatisfactory grades are not acceptable in required courses. Consideration will not be extended to anyone with an overall or required course grade point average of less than 2.50 at the time of application.

4. TIME LIMITATION: All required courses in the advanced physical and biological science categories must have been completed within six calendar years prior to the anticipated date of enrollment in the School of Veterinary Medicine.

Application Procedure

Admission of Alabama residents to the School of Veterinary Medicine must be gained through formal application made between September 15 and October 15 preceding the Fall Quarter in which admission is desired. The length of residence of Alabama applicants shall be a factor. The final date for accepting applications from non-Alabama students is February 1st and SREB applicants should consult their advisers for their exact dates.

Applicants should submit the following:

1. Two completed application for-admission forms* supplied by the School of Veterinary Medicine.
2. Two official transcripts* from each college or university attended.
3. A list of courses in progress at time of application, if any.
4. Application fee—\$10.00 (not applicable if previously enrolled at Auburn University).

If a student is admitted to the School of Veterinary Medicine, he must submit one completed physical examination report on a form supplied by Auburn University at least three weeks prior to date of registration (not required by students formerly enrolled at Auburn University) and two supplemental official transcripts of any work completed after application is filed.

The final selection of students is made by the Committee on Admissions and Standards of the School of Veterinary Medicine, Auburn University. These selections are made from the applicants who have been certified by the committees in the respective states after giving due consideration to scholastic record and general adaptability for the profession. The right is reserved to accept or reject any applicant. All applications for admission must be on file at the School of Veterinary Medicine by October 15 preceding date of admission.

MICROSCOPES—In order to be admitted to the School of Veterinary Medicine, a student must own a compound microscope acceptable to the faculty. The student must furnish a microscope in all courses requiring the use of this instrument.

ADMISSION UNDER THE REGIONAL PLAN—Under the Regional Plan for Veterinary Training, the School of Veterinary Medicine currently serves two states: Alabama and Kentucky.

The Land-Grant institution in each state participating under the Southern Regional Education plan maintains counseling and guidance service for students desiring admission to the School of Veterinary Medicine. Students attending other institutions should contact the Land-Grant School adviser in their state for information concerning admission requirements.

*Only one is required of students formerly enrolled at Auburn University.

Scholastic Requirements

All applicants and students in the professional program are subject to the academic and disciplinary regulations of the School of Veterinary Medicine in addition to those of Auburn University.

Any student who earns less than a 2.25 grade-point average for any quarter will be placed on academic probation. A student who fails to earn a 2.25 grade-point average for any two quarters in the same academic or calendar year may be dropped from the rolls of the School of Veterinary Medicine for scholastic deficiency. In addition, a student who does not have an overall average of 2.25 for an academic year or who does not have a veterinary school cumulative average of 2.25 at the end of any academic year may be required to withdraw from the School of Veterinary Medicine.

A student who makes a grade of F on any course may be required to withdraw from the School of Veterinary Medicine until such time as the course is offered again. Such student may be required to repeat certain other courses in the curriculum for that quarter.

Clinical courses are unique in that the art and skills to be developed in them can only be acquired by full participation in the laboratories. The attendance in these courses is required except in case of illness or other extenuating circumstances as may be judged by the involved instructor. The grading in these clinical laboratory courses is primarily by subjective evaluation. When a course involves student rotation through several disciplines or sections, the student must receive a passing grade in each area before a passing grade can be given for the course.

The responsibility for counseling is shared by the Faculty of this School and the Career Development Service.

Required Withdrawal

The faculty of the School of Veterinary Medicine reserves the right to require the withdrawal at any time of any student who in the judgment of the admissions and standards committee is not profiting from the instruction offered, who is neglectful, irregular, dishonest or indifferent in the performance of required duties and studies, or whose character or conduct is inconsistent with good order of the veterinary school or with the standard of the veterinary profession.

Requirements for Graduation

To be eligible for the D.V.M. degree, candidates must complete all of the required courses in the order listed in the curriculum in veterinary medicine with a minimum overall grade-point average of 2.25. Following completion of all academic work, each student will be required to serve a preceptorship of one quarter with a reputable practicing veterinarian. A certificate of satisfactory completion of a preceptorship will be required for graduation.

A graduation fee of \$15.00 must be paid at the beginning of the quarter of graduation and all indebtedness due the institution must be paid prior to graduation.

Curriculum in Veterinary Medicine (VM)

FIRST YEAR

Second Quarter

First Quarter		Second Quarter		Third Quarter	
VM 320	Anatomy I.....5	VM 321	Anatomy II.....5	VM 322	Anatomy III.....5
VM 326	Micro. Anat. I.....5	VM 327	Micro. Anat. II.....5	VM 328	Micro. Anat. III.....4
VM 313	Physiology I.....4	VM 315	Physiology III.....2	VM 318	Physiology VI.....4
VM 314	Physiology II.....2	VM 316	Physiology IV.....3	VM 331	Vet. Micro. I.....4
VM 300	Orientation.....2	VM 317	Physiology V.....3	VM 319	Pharmacology I.....2
VM 313	Physiology Lab. I.....1	VM 315	Physiology Lab. II.....1	VM 318L	Physiology Lab. III.....1

First Quarter		SECOND YEAR		Third Quarter	
		Second Quarter			
VM 405	Pathology I.....6	VM 406	Pathology II.....5	VM 423	Clinical Path.....5
VM 411	Vet. Micro. II.....4	VM 410	Vet. Parasitol. II.....5	VM 414	Vet. Med. I.....5
VM 403	Physiology VII.....4	VM 402	Pharmacology III.....4	VM 407	Pathology III.....4
VM 409	Vet. Parasitology I.....4	VM 412	Vet. Micro. III.....5	VM 413	Preventive Med.....4
VM 401	Pharmacology II.....3	VM 404	Physiology VIII.....3	VM 408	Lab. An. Md.....3
VM 428	Phy. Diagnosis.....2	VM 429	Phy. Diagnosis.....1	VM 434	Appl. Anatomy.....2
		THIRD YEAR			
VM 420	Vet. Med. II.....5	PH 422	Avian Diseases.....5	VM 440	Clinics VII.....6
VM 424	Vet. Med. & Surg. I.....6	VM 425	Vet. Med. & Surg. II.....5	VM 444	Clinics II.....7
VM 421	Vet. Surg. I.....3	VM 438	Vet. Med. IV.....4	VM 435	Theriogenology.....5
VM 427	Vet. Med. & Surg. II.....3	VM 422	Vet. Surg. II.....3	VM 453	Seminar.....2
VM 431	Vet. Radiology.....4	VM 451	Public Health II.....2		
VM 448	Vet. Surgery III.....2	VM 432	Vet. Mycology.....2		
		VM 449	Vet. Surgery IV.....2		
		FOURTH YEAR			
VM 437	Vet. Med. III.....5	VM 442	Clinics IX.....6	VM 443	Clinics X.....6
VM 441	Clinics VIII.....6	VM 446	Clinics IV.....7	VM 447	Clinics V.....7
VM 445	Clinics III.....7	VM 453	Seminar.....2	VM 430	Jurisp. & Ethics.....2
VM 453	Seminar.....2	VM 439	Vet. Med. V.....5	VM 452	Public Health III.....2
				VM 453	Seminar.....2
		Spring Quarter			
		VM 454	Preceptorship.....0		
TOTAL — 249 QUARTER HOURS					

Graduate Programs

Master of Science degrees are offered in each department in the School of Veterinary Medicine. The Doctor of Philosophy degree is offered in a school-wide program. Refer to the *Graduate School Bulletin* for further information.

The Graduate School

PAUL PARKS, *Dean*]

HUGH DONNAN, *Associate Dean*

DON RICHARDSON, *Associate Dean*

A STUDENT with a bachelor's degree from an accredited college or university may apply to the Dean of the Graduate School for admission. Application forms for admission may be secured from the Graduate School and must be submitted at least three weeks before registration.

The *Graduate School Bulletin* should be consulted for detailed information on the regulations of the Graduate School, the courses offered for graduate credit, the requirements for degrees, fellowships and assistantships, and other matters pertaining to graduate work in this institution. Undergraduates wishing to register for graduate courses should consult the *Graduate School Bulletin* for regulations concerning such registration. A bulletin may be obtained upon request from the Dean of the Graduate School.

Graduate Degrees

The Master's Program

Master of Science degrees are offered in the areas of Aerospace Engineering; Agricultural Economics and Rural Sociology; Agricultural Engineering; Agronomy and Soils; Anatomy and Histology; Animal and Dairy Sciences; Botany, Plant Pathology and Microbiology; Business; Chemical Engineering; Chemistry; Civil Engineering; Consumer Affairs; Counselor Education; Economics; Educational Leadership; Educational Media; Electrical Engineering; Elementary Education; Entomology; Family and Child Development; Fisheries and Allied Aquacultures; Forestry; Geology; Health, Physical Education and Recreation; Horticulture; Industrial Engineering; Large Animal Surgery and Medicine; Mathematics; Mechanical Engineering; Microbiology; Nuclear Science; Nutrition; Nutrition and Foods; Ornamental Horticulture; Pathology and Parasitology; Pharmacal Sciences; Pharmacy Care Systems; Physics; Physiology and Pharmacology; Poultry Science; Psychology; Rehabilitation and Special Education; Secondary Education; Small Animal Surgery and Medicine; Sociology; Toxicology; Vocational and Adult Education; Wildlife Management; and Zoology.

Master of Arts degrees are offered in the areas of English; French; History; Political Science; Sociology; Spanish; and Speech Communication.

Other Master's Degrees: Master of Agriculture, Master of Aquaculture, Master of Arts in College Teaching, Master of Business Administration, Master of Education, Master of Fine Arts, Master of Forestry, Master of French Studies, Master of Hispanic Studies, Master of Industrial Design, Master of Industrial Engineering, Master of Mechanical Engineering, Master of Music, Master of Regional Planning, Master of Speech Communication.

The Doctoral Degree Program

The **Doctor of Education** degree is offered with specializations in Counselor Education, Curriculum and Instruction, Educational Leadership, Elementary Education, Rehabilitation and Special Education, Secondary Education, and Vocational and Adult Education.

The **Doctor of Philosophy** degree is offered in the Departments of Aerospace Engineering, Agricultural Engineering, Agronomy and Soils, Animal and Dairy Sciences, Botany, Plant Pathology and Microbiology, Chemical Engineering, Chemistry, Civil Engineering, Electrical Engineering, English, Fisheries and Allied Aquacultures, Forestry, History, Industrial Engineering, Mathematics, Mechanical Engineering, Physics, Poultry Science, Psychology, Wildlife Management, and Zoology-Entomology, and interdepartmental programs in Nutrition, Physiology, and Veterinary Medicine.

Research Program with the Oak Ridge

Associated Universities

Auburn University is one of the sponsoring institutions of the Oak Ridge Associated Universities research program located at Oak Ridge, Tennessee. Through this cooperative association Auburn's graduate research programs have at their disposal the facilities of the National Laboratories in Oak Ridge and the research staffs of these laboratories.

Information on the opportunities for research in the Oak Ridge Laboratories is available in the office of the Dean of the Graduate School.

Interdepartmental and Interdisciplinary Curricula

Undergraduate

Environmental Health (ENH)

THE CURRICULUM in Environmental Health is an interdepartmental program administered by a faculty committee from the Schools of Agriculture, Education, Engineering, Home Economics and Pharmacy and is based on the strengths of Auburn University in the biological and physical sciences.

Environmental health specialists are employed by industries, consultants, trade associations, and by governmental agencies to work in areas such as food sanitation, water supply sanitation, refuse and waste control, air pollution control, and institutional sanitation.

The program leading to a Bachelor of Science degree is designed to prepare graduates for careers in the broad field of environmental health. Interested students should contact Dr. R. Y. Cannon in the Animal and Dairy Science Department for further details concerning the program.

Curriculum in Environmental Health

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
CH 103	Fund. Chem. & Lab.....	5	CH 104	Fund. Chem. & Lab.....	5	BI 101	Prin. Biol.....	5
MH 160	Pre-Cal. w. Trig.....	5	MH 161	An. Geom. & Cal.....	5	CH 105	Fund. Chem. & Lab.....	5
EH 101	English Comp.....	3	EH 102	English Comp.....	3	EH 103	English Comp.....	3
HY 204	Tech. & Civiliz.....	3	HY 205	Tech. & Civiliz.....	3	HY 206	Tech. & Civiliz.....	3
	Basic ROTC or PE.....	1		Basic ROTC or PE.....	1		Basic ROTC or PE.....	1

SOPHOMORE YEAR

First Quarter			Second Quarter			Third Quarter		
BI 104	Biol. Human Affrs.	5	EC 200	Economics I	5	AM 304	Meteorology	5
SY 201	Intr. Socio.	5	PS 205	Physics	5	PS 206	Physics	5
CH 203	Org. Chem	5	SC 202	App. Sp. Comm.	3	RSY 362	Comm. Organiz.	5
NF 112	Nutrition & Man.	3	CH 204	Anal. Chem. & Lab.	5	BY 216	Intr. Bio Comp.	3
JUNIOR YEAR								
PG 212	Psychology	3	ZY 251	Physiology	5	MT 344	Envir. Law	4
ZY 250	Human Anat.	5	EHA 304	Tech. Writing	3	ADS 204	Anim. Biochem. or	5
BY 300	Gen. Microbiol.	5	PCS 563	Public Health	5	NF 318	Nut. Biochem.	5
	Elective	3		Elective	5		Elective	5
							Prof. Elective	3

SENIOR YEAR

BY 501	Bio. Statistics	5	BY 541	Sanitary Microbiol.	5		Independent Study*	5
IE 438	Safety Engr.	5	ADS 515	Food Plant Sanitat.	3	CE 527	Water Supply & Trmt.	5
	Prof. Elective	8	CE 524	Air Pollution	5	PY 537	Fund. of Bionucleonics	3
				Prof. Elective	3		Prof. Elective	5

TOTAL—208 QUARTER HOURS

*An area of particular interest to the individual student can be selected for independent study, i.e. ADS 490, BY 460, CE 490, NF 408, PY 413, etc.

Certificate in Aging Studies

The Certificate in Aging Studies is a multidisciplinary program designed for students interested in problems of aging persons which will give them a general competency in gerontology. The career-oriented option complements a student's major field of study and, upon completion of the 25 hours, lead to a Certificate in Aging Studies. The program is open to all students who choose to use their elective hours in this manner. Interested students should contact the academic advisers in their School and the School of Home Economics for further details concerning the program. The required courses (25 credit hours) and their prerequisites are as follows:

PG 302 Psych. Aspects of Death & Dying	3
*RSY 371 Applied Res. Meth. & Prog. Eval.	3
ZY 360 Physiology of Aging (Pr. BI 103)	3
FCD 477 Hum. Dev. V.: Family & Aging (Pr. FCD 270)	3
SY 477 Soc. of Aging (Pr. SY 201)	3
PG 507 Maturity & Aging (Pr. PG 212 or FCD 267)	5
FCD 497F Dir. Fid. Exp.: Aging (Pr. FCD 487)	
or	
Special Problems Course offered in student's major department (must incorporate Aging Studies in some way)	5

*RSY 370 (5), Methods of Social Research or a statistics or research course required by the student's major area may be substituted. Credit will not be given for both RSY 371 and RSY 370 or SY 370.

NOTE: There are interdepartmental curricula offered in Computer Science and computer engineering. See School of Engineering section, pages 150-153.

Graduate

Interdepartmental Programs

The Graduate School offers three interdepartmental programs which lead to the Doctor of Philosophy degree: Nutrition, Physiology, and Veterinary Medicine. Students in the Interdepartmental Sociology program may earn the Master of Arts, Master of Science, or Master of Arts in College Teaching degree. Students in Nutrition and Physiology may also earn the Master of Science degree. These programs are supervised by coordinating committees appointed by the Dean of the Graduate School. Departments and schools cooperating in the Nutrition program are: Animal and Dairy Sciences, Fisheries and

Allied Aquacultures, Nutrition and Foods, and the School of Veterinary Medicine. The faculty and students in Physiology are drawn from the departments of Animal and Dairy Sciences, Chemistry, Physics, Poultry Science, Psychology, Veterinary Physiology and Pharmacology, Veterinary Anatomy and Histology, and Zoology-Entomology. The departments of Sociology and Anthropology, Agricultural Economics and Rural Sociology, and Foundations of Education are the cooperating departments in Sociology.

Reserve Officers Training Corps

Department of Military Science

Col. Linus H. Fiely
Professor of Military Science

MILITARY SCIENCE INSTRUCTION leading to an Army commission as a second lieutenant is available to both male and female students. The Military Science curriculum is divided into two programs, Basic and Advanced. Program requirements are discussed in the following paragraphs.

Basic ROTC Program

The Basic Camp consists of six weeks of field training conducted at an Army Post during the summer. Basic Camp is not required for students completing the Basic Course described above. It is designed for transfer students and sophomores, or students with 6 quarters remaining who wish to substitute the successful completion of the basic camp for the six-quarters resident Basic Course and enroll in the Advanced Course. Students may apply to the Professor of Military Science and enter into an agreement to complete Basic Camp and the Advanced Course during the winter quarter of each year. While attending basic camp, students are paid approximately \$550.00, plus reimbursement for travel expenses at the rate of ten cents per mile to and from camp. Uniforms, quarters, medical care and rations are furnished by the government during the camp period.

Advanced ROTC Program

The Advanced Program is designed to produce officers for both the Active Army and the Reserve Components. Successful completion of the Advanced Program and degree completion qualifies the student for active duty as a second lieutenant. A program also exists wherein the student can be commissioned as a second lieutenant in the reserve components after completion of the Advanced Program, but prior to degree completion. Distinguished Military Students may apply for a Regular Army commission. The Advanced Program consists of a six quarter course, normally taken during the junior and senior years, and is sufficiently flexible to allow those who desire active duty to get it, or to guarantee duty with the reserve components for those who desire that particular option. Three credit hours per quarter are granted for completion of the Advanced Program. Students are paid a subsistence allowance of \$100.00 per month, not to exceed 600 days while enrolled in the Advanced Course.

Qualified veterans and three-year JROTC participants may enroll in the Advanced ROTC Program without taking the Basic Program, or attending Basic Camp.

Advanced course students are eligible to participate in a Simultaneous Membership Program with the Army National Guard or Army Reserves. In addition to the \$100.00 per month from the advanced program in ROTC an additional \$70.00 per month will be given while participating in this program.

An advanced camp of six weeks duration must be attended by the student before becoming eligible for a commission as a second lieutenant. Advanced camp is normally attended during the summer between the end of the junior and the start of the senior years. While attending advanced camp students are paid $\frac{1}{2}$ base pay of a second lieutenant and are reimbursed for travel expenses. Uniforms, lodging, medical care, and food are furnished by the government during the camp period.

Financial Assistance Program

The Army ROTC offers a scholarship program designed to provide financial assistance to outstanding men and women in the program who are interested in the Army as a career. Each scholarship provides free tuition, textbooks and laboratory fees in addition to pay of \$100.00 per month for the period that the scholarship is in effect.

Scholarships may be awarded for periods of one, two, three or four years. Four-year scholarships are awarded to selected high school applicants who plan to attend a University offering Army ROTC in its curricula.

Three- and two-year scholarships are awarded to selected applicants who are qualified to enter the advanced program. A one-year scholarship is available to selected juniors on a competitive basis.

Department of Naval Science

Captain Frank Shaughnessy, USN
Commanding Officer and Professor of Naval Science

THE PURPOSE of NROTC is to provide well-educated junior officers for the regular Navy and Marine Corps and to provide a reserve of trained officers for service in a national emergency. ALL NROTC programs are open to eligible women students.

TYPES OF NROTC STUDENTS

Students in the NROTC are of three types:

1. NROTC Navy-Marine Scholarship Program. Successful completion of this program leads to a commission in the regular Navy or Marine Corps and service at the pleasure of the President. The minimum active duty service is four years.

Tuition, fees, and textbooks for these students will be paid for by the Government. Students receive subsistence pay of \$100 per month for a maximum of 40 months. Active duty pay for summer training is approximately \$380 per month.

Although the Navy is emphasizing engineering and science majors, students, with some exceptions, may take most Auburn University majors leading to a baccalaureate degree. These will be considered on an individual basis by the Commanding Officer prior to appointment.

In addition to the requirements of their major, NROTC students are required to complete 29 quarter hours of Naval Science. Summer quarters are occupied with two at-sea training cruises and one summer period of career orientation, lasting from four to eight weeks each.

Entrance to the Navy-Marine Scholarship Program is effected through nation-wide competition. Applicants must make independent arrangements to take either the Scholastic Aptitude Test or the American College Test.

Scholarship students may resign without obligation at any time prior to the beginning of their third year in the Program.

2. Four-Year NROTC Navy-Marine College Program. These students may become commissioned officers in the Navy or Marine Corps Reserve. They are entitled to subsistence pay of \$100 per month for a maximum of 20 months during their final two years of NROTC training. They are required to serve on active duty for three years and retain their commission for a total of six years from date of appointment, unless sooner released by the Secretary of the Navy. These students are selected by the Professor of Naval Science.

Students in the four-year program who have not yet received the \$100 per month subsistence payments may resign from the NROTC Program without obligation.

3. Two-Year NROTC Navy-Marine Scholarship Program. Selections for this program are made on a national basis from nominations submitted by the Professors of Naval Science. Selected applicants will attend a Naval Science Institute (NSI) for six weeks during the summer prior to their junior year. Successful completion of NSI will qualify these students for enrollment in the advance course in the NROTC College Program.

Students in both the latter programs may apply for the Scholarship Program through national competition, or for Professor of Naval Science nomination for appointment as Scholarship students.

The student must complete all Naval Science requirements prior to or concurrently with receipt of a baccalaureate degree. Summer training consists of an at-sea training cruise between the junior and senior years.

Qualifications for enrollment, application blanks and information bulletins are available at high schools, colleges, recruiting stations, and the Auburn NROTC Unit.

Equipment

Uniforms, Naval Science textbooks, and equipment necessary to the NROTC Program are furnished in all programs.

Curriculum

Naval Science curriculum consists of the following hours per week: freshman and sophomore Naval Science courses and Marine Corps option courses, four hours; junior and senior Navy courses, five hours.

Naval Science subjects carried during the four-year curriculum are listed in the Description of Courses section of this Bulletin. Only the 300/400 series subjects are applicable to the Two-Year Program.

Freshman, sophomore, and Marine Corps option courses carry two quarter hours of credit. These hours of credit will be considered as a part of the normal quarterly load; however Auburn University graduation requirements will be increased by 12 to 18 hours, depending upon the school in which enrolled, over the number of hours listed in the University catalog. Navy Option Scholarship students must also complete courses in calculus and physics.

Department of Air Force Aerospace Studies (AFROTC)

COLONEL WILLIAM K. RECTOR, JR.

Professor of Aerospace Studies and Commander

AFROTC is the nation's largest source of Air Force Officers. It provides a basic understanding of the role of air power and management of the Air Force. Enrollment in

the General Military Course is open to all freshmen and sophomore men and women and does not require a military commitment. The Professional Officer Course is open to qualified men and women and leads directly to an Air Force commission.

General Military Course

(Basic Course)

The General Military Course is composed of one class hour and one Leadership Laboratory hour per week. One credit hour is allowed for each quarter of the six quarter basic course. Leadership Laboratory includes briefings by various Air Force commands and staff agencies and related corps projects. Students are provided the opportunity to visit various Air Force bases to acquaint them with operational Air Force units.

Applicants for the Advanced Officers Course attend a summer Field Training Course between their sophomore and junior years. The Air Force furnishes uniforms, housing, medical care, rations, a round trip travel allowance and military pay at field training.

Professional Officer Course

(Advanced Course)

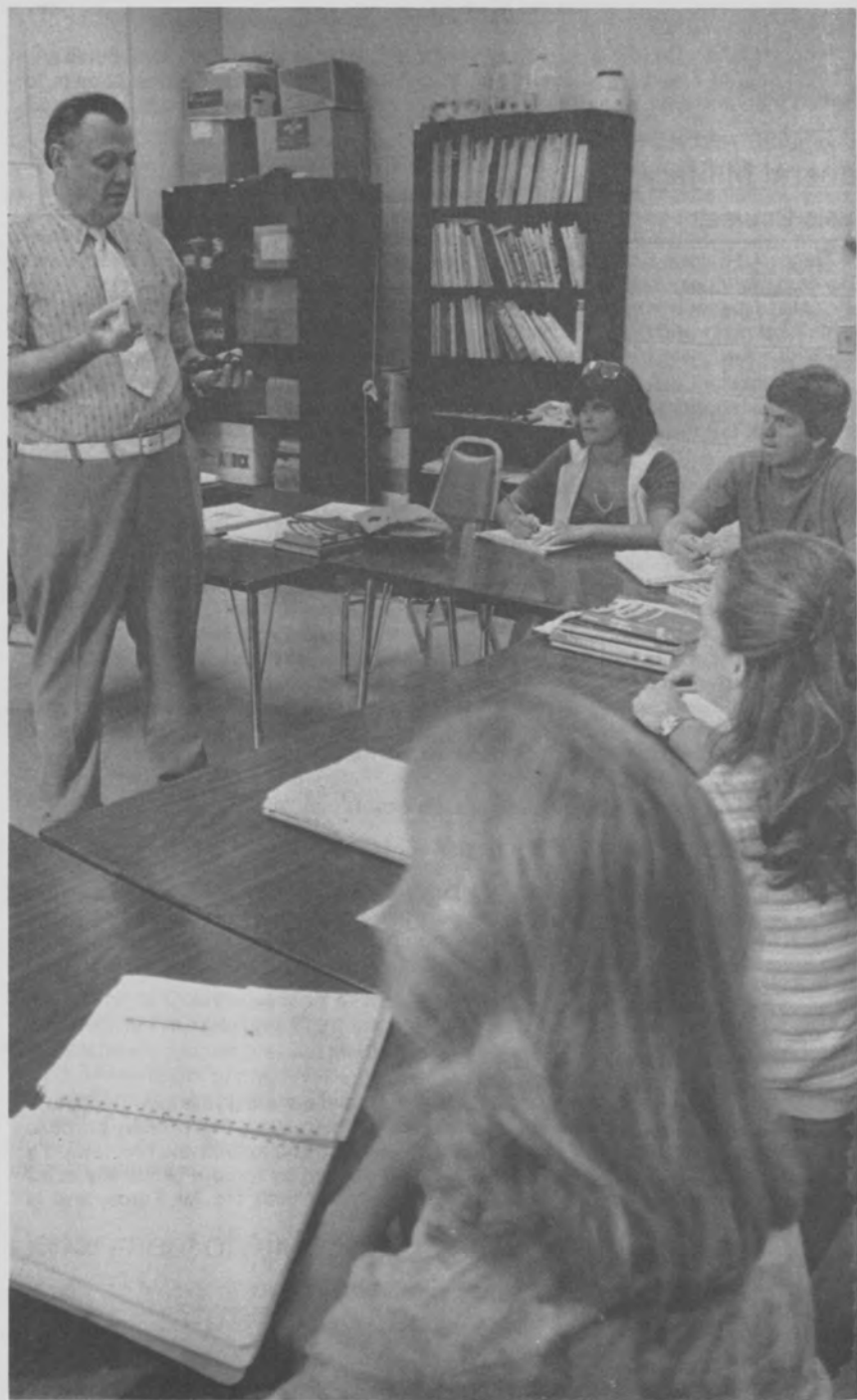
The Professional Officer Course consists of a six-quarter course normally taken during the junior and senior year. Enrollment in the advanced course is also open to graduate students if they have six-quarters of school remaining. Three classroom hours of instruction and one hour of Leadership Laboratory are taken per week. Three credit hours per quarter or a total of 18 credit hours are granted for completion of the Professional Officer Course; however, only six to 12 credit hours may be applied towards the total credits required for graduation. Students enrolled in the program are given a monthly subsistence allowance and those selected for the pilot category are eligible for the Flight Instruction Program.

College Scholarship Program

Four, three and two-year Air Force ROTC scholarships are available for male and female students who qualify. Scholarships provide full tuition, laboratory expenses and incidental fees to include textbooks, \$100 a month allowance (tax free), and all uniform items. Scholarships are awarded to qualified students based on application to, and selection by central selection boards.

Flight Instruction Program

The Flight Instruction Program is conducted during the cadet's last year in AFROTC and provides the pilot category cadets with 25 hours of flight training. The primary purpose of this training is to determine a cadet's aptitude for flying and to motivate him toward a career as an Air Force pilot. The Flight Training, provided by Auburn University at no expense to the student, is conducted under a contract with the Air Force, and is monitored by the FAA.



Courses of Instruction

IN THIS SECTION are listed and described all courses taught by the departments of the University. The courses are presented by subjects, arranged alphabetically. The subject name (the heading in large type) is followed by the departmental symbol in parentheses. Below the subject appears a list of the departmental faculty.

The subject name (symbol) together with the course number constitutes the official designation for the course for purposes of registration and official records. The specific course title appears in boldface following the course number. The figures in parentheses denote the number of quarter hours of credit for the course. Following the credit hours are listed lecture and laboratory clock hours, if applicable. If none is listed, the course consists of lecture hours equal in number to course credit. Next appear the prerequisites, if applicable.

Courses are numbered according to the following system:

- 101-199** Courses primarily for freshmen.
- 201-299** Courses primarily for sophomores.
- 301-399** Courses primarily for juniors.
- 401-499** Courses primarily for seniors. Not open to graduate students.
- 501-599** Courses for advanced undergraduate and graduate students; and for fifth year students in professional curricula.
Junior Standing Required For Enrollment At This Level.
- 601-799** Courses for graduate students

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Note: COI Is Used For Consent Of Instructor In Course Description Headings.

University Courses (U)

The following courses, interdisciplinary and experimental in character, are designed to enable the student to see in a wide perspective the relationship of individual courses in his curriculum and to understand more fully the dominant ideas and concepts confronting him in the modern world. University Courses are open to students in all curricula.

- 190. THEORY AND PRACTICUM IN COLLEGIATE SPORTS (1).** Conditioning activities in preparation for competitive football. Skills and fundamental techniques of physical activities related to football. Coaching techniques applicable to all areas of athletic competition. S-U graded.
- 201. FORUM (1).** May be taken more than one quarter for a maximum of 3 credits. S-U only. Credit is given in recognition of significant attendance at public academic lectures, concerts, and other events. Requires attendance at seven of the 15-20 FORUM-designated events, which are chosen from various University lecture and concert series and departmental programs. Administered by Department of Political Science.
- 210. THE NATURE OF MATERIALS FOR LIVING (5). LEC. 4, LAB. 1.** Pr., sophomore standing. The structures and properties of the principal classes of useful materials are described in relation to their applications. Topics will include metals, ceramics, plastics, compatibility, durability, and appearance as related to consumer goods, housing, and environment. The laboratory will include related films, demonstrations, and tests performed by students. Administered by Department of Mechanical Engineering.
- 270-271-272. ASCENT OF MAN (3). LEC. 2, LAB. 1.** Based on the films and text prepared by Jacob Bronowski, the course deals with the historic interaction between science and culture. Students view each week one film segment in the *Ascent of Man* series, with subsequent small-group classroom sessions devoted to discussion of the film and auxiliary readings.
- 275. INTERPERSONAL RELATIONS (3).** A multi-disciplinary study of methods used by human beings in their interactions that tend to be mutually rewarding. Emphasis is on practical applications within the context of the student's present fields of study and projected fields of work.
- 305. THE MODEL UNITED NATIONS (1).** May be taken more than one quarter for a maximum of 3 credits. S-U only. Preparation of materials for, and active participation in, the sessions of the Model United Nations program held annually on the campus. Administered by Department of Political Science.
- 399. EXPERIENTIAL LEARNING (2-6).** Pr., sophomore standing and COI. May be repeated once for credit. A maximum of 6 credits allowed. Students may obtain academic credit for participation in learning experiences of a practical nature available outside the normal curricular offerings of the University. Normally S-U Graded.

Accounting and Finance (ACF)

Professors Hill, Robinson, and Thorne

Associate Professors Criss, Davis, Edmonds, Hale, Hand, Lindbeck, Lloyd, McCord,
Miley, and Tole

Assistant Professors Rogow, Head, Alderman, Beard, Dinius,
Rose, Williams, and Worthington

Instructors Evans, Haygood, Jahera, Thompson, and Waters

ACCOUNTING

211. **PRINCIPLES OF ACCOUNTING I (4). LEC. 3, LAB. 2.** Pr., sophomore standing. Basic accounting principles, including the accounting cycle and preparation of financial statements. ACF 211 is not open to students with credit in ACF 215.
212. **PRINCIPLES OF ACCOUNTING II (4). LEC. 3, LAB. 2.** Pr., ACF 211. A continuation of accounting principles with emphasis on their application to partnerships, corporations, and preparation and analysis of various financial statements.
213. **MANAGERIAL COST AND BUDGETING (4). LEC. 3, LAB. 2.** Pr., ACF 212. The third course for accounting majors or a terminal course for non-accounting majors. Introductory cost accounting and budgeting with some emphasis on distribution costs and managerial accounting problems.
215. **FUNDAMENTALS OF GENERAL AND COST ACCOUNTING (5). LEC. 3, LAB. 4.** Pr., sophomore standing. Fundamental concepts and principles of general and cost accounting. Emphasis on accumulating, reporting, and interpreting cost data in the production area of business operations. (Not open to undergraduates majoring in Business. Credit in ACF 211 precludes credit for ACF 215.)
311. **INTERMEDIATE ACCOUNTING I (5).** Pr., ACF 213. Accounting principles and theory, including a review of the accounting cycle and accounting for current assets, current liabilities, and investments.
312. **INTERMEDIATE ACCOUNTING II (5).** Pr., ACF 311. A continuation of accounting principles and theory with emphasis on accounting for fixed assets, intangibles, and corporate capital structure.
313. **INTERMEDIATE ACCOUNTING III (5).** Pr., ACF 312. A continuation of accounting principles and theory with emphasis on accounting for long-term liabilities and investments, pension costs, leases, analysis of financial statements and funds flow.
314. **INCOME TAX ACCOUNTING (5).** Pr., ACF 212. Interpretation of the regulations, preparation of returns, and the keeping of accounting records for tax purposes.
319. **BUSINESS LAW FOR ACCOUNTANTS (5).** Pr., ACF 312. Business law applied to the environment and applications of accountancy.
400. **STUDENT INTERNSHIP PROGRAM (1-10).** Pr., junior standing and selection by the committee directing the School of Business Intern Program.
410. **COST ACCOUNTING (5).** Pr., ACF 213 and junior standing. Accounting principles and procedures involved in job-order, process, and standard cost accounting.
411. **FINANCIAL ACCOUNTING THEORY (5).** Pr., ACF 313. An evaluation, critique, and application of financial accounting theory to current reporting problems.
414. **ADVANCED INCOME TAX ACCOUNTING (5).** Pr., ACF 313, 314 and senior standing. Special tax accounting problems of individuals, partnerships, corporations, estates, and trusts. Extensive use will be made of a tax service program.
415. **BUSINESS INFORMATION AND ACCOUNTING SYSTEMS (5).** Pr., ACF 313 and senior standing. The design, installation, operation, and interrelationship of accounting systems which constitute the information flows and provide the basis for financial decisions in modern organizations.
416. **AUDITING (5).** Pr., ACF 415 and senior standing. The principles of auditing with particular attention to methods of testing, analyzing, and summarizing accounting records.
417. **ADVANCED ACCOUNTING (5).** Pr., ACF 313, 410, and senior standing. Specialized accounting problems, including application of quantitative methods.
418. **BUSINESS COMBINATIONS AND OTHER PROBLEMS (5).** Pr., ACF 313 and senior standing. Accounting for business combinations, home and branch office procedures, partnerships, installment sales, consignments, and receiverships.
419. **GOVERNMENTAL ACCOUNTING (5).** Pr., ACF 313 or ACF 313 concurrently and senior standing. Budgeting and accounting procedures of governmental divisions.
490. **SPECIAL PROBLEMS. (1-10).** Pr., ACF 313 and senior standing. Advanced individual research and study of accounting and finance under guidance of a faculty member.
491. **VETERINARY BUSINESS METHODS (3). LEC. 3, LAB. 1.** Pr., 4th yr. Summer. Various aspects of business methods and legal concerns in starting a veterinary practice. Emphasis on accounting systems, record keeping procedures and taxation.
499. **SEMINAR IN CURRENT ACCOUNTING TOPICS (1).** Pr., graduating seniors. The current literature, problems, and controversies affecting the accounting profession.

GRADUATE

- 513. **FOUNDATIONS IN ACCOUNTING FOR MANAGEMENT (5).** Pr., MH 140 and consent of the Director of the MBA program, School of Business. An accelerated course in accounting fundamentals and business applications.
- 610. **MANAGERIAL ACCOUNTING (5).** Pr., ACF 513 or equivalent. For the MBA student confronted with business problems requiring a comprehensive understanding of accounting concepts, and accepted methods of applying these concepts in decision-making, planning, and control.
- 611. **ADVANCED ACCOUNTING THEORY (5).** Pr., ACF 313. A review of the origin and development of double-entry accounting; followed by a critical study of the theory of modern accounting principles and procedures.
- 614. **RESEARCH IN FEDERAL TAXATION (5).** Pr., ACF 414. Analysis of federal taxation problems and relationships among code provisions, generally accepted accounting principles, and business decisions.
- 615. **FINANCIAL INFORMATION SYSTEMS (5).** Pr., ACF 313 or COI. Identification, evaluation, and modification of critical information flows into efficient and effective information systems to service modern management decision needs.
- 616. **ADVANCED AUDITING (5).** Pr., ACF 416. Application of auditing principles and procedures to practical problems in public and private accounting.
- 617. **ADVANCED ACCOUNTING PROBLEMS (5).** Pr., ACF 611 or COI. An extension and a consolidation of all the other advanced accounting courses. Preparation for special accounting examinations.
- 618. **ADVANCED FINANCIAL REPORTING (5).** Pr., ACF 611 and ACF 616, or COI. An in-depth study of current financial reporting problems and the resolution of such problems in accordance with professional standards relating to financial reporting.
- 621. **DEVELOPMENT OF ACCOUNTING THOUGHT (5).** Pr., ACF 313. The origin and development of accounting theories and concepts.
- 650. **SEMINAR (1-10).** Pr., COI. Intensive study and analysis of accounting and finance problems.
- 681. **DETERMINISTIC QUANTITATIVE METHODS IN ACCOUNTING (3).** Pr., MN 581 or equivalent. Deterministic quantitative methods for business applications. (Same as MN 681.)
- 682. **STOCHASTIC QUANTITATIVE METHODS IN ACCOUNTING (3).** Pr., MN 581 or equivalent. Various quantitative methods applied to decision-making under conditions of risk and uncertainty. (Same as MN 682.)
- 684. **SEMINAR IN TAX FACTORS IN MANAGEMENT DECISIONS (5).** Pr., ACF 610 and COI. Primarily non-technical. Study of tax consequences apt to attach to common business transactions.
- 690. **SPECIAL PROBLEMS (1-15).** Pr., COI. Variable content in the accounting areas.
- 699. **RESEARCH AND THESIS.** Credit to be arranged.

FINANCE

- 320. **RISK AND INSURANCE (5).** Pr., EC 200 and junior standing. Essentials of risk management, with the emphasis on the use of insurance in meeting these risks; including the characteristics of property, liability, life and health insurance.
- 323. **REAL ESTATE (5).** Pr., EC 200 and junior standing. The fundamental principles and practices as applied to the purchase, sale, lease, mortgage, title, and management of real estate.
- 340. **PERSONAL FINANCE (3).** Pr., non-business student, junior standing. Plans for managing personal financial problems involving insurance, housing, household budgeting, investments, personal and bank loans, credit and time buying, etc.
- 361. **PRINCIPLES OF BUSINESS FINANCE (5).** Pr., EC 202, ACF 212, and junior standing. Short-term, intermediate and long-term financing of business firms.
- 363. **ADVANCED BUSINESS FINANCE (5).** Pr., ACF 361. A continuation of ACF 361 with emphasis on capital budgeting, cost of capital, growth, promotion, and reorganization.
- 367. **MONEY MARKETS AND FINANCIAL INSTITUTIONS (5).** Pr., ACF 361. Structure and operation of commercial banks and other financial institutions and their role in the financing of business.
- 400. **STUDENT INTERNSHIP PROGRAM (1-10).** Pr., junior standing and selection by the committee directing the School of Business Intern Program.
- 421. **PROPERTY INSURANCE (5).** Pr., ACF 320. The principles, uses and types of insurance with particular emphasis on fire, marine, automobile, and casualty lines.
- 422. **LIFE INSURANCE (5).** Pr., ACF 320. The organization of the life insurance business and the various types of contracts.
- 451. **MULTINATIONAL FINANCIAL MANAGEMENT (5).** Pr., ACF 363 or COI. The impact of various tax regulations, currency controls and exchange rates on the multinational firm.
- 464. **INVESTMENTS (5).** Pr., ACF 361, junior standing. Individual investment policies, investment institutions, and types of investments available.
- 466. **SECURITY ANALYSIS AND PORTFOLIO MANAGEMENT (5).** Pr., ACF 363 and 464. Analysis techniques and selection of securities to meet specific investment objectives.

467. **CONSUMER FINANCE (5).** Pr., ACF 361 and 367 or COI. Analysis of the growth of consumer credit in the United States with emphasis upon recent legal and technological changes in the field of credit.
469. **MANAGEMENT OF FINANCIAL INSTITUTIONS (5).** Pr., ACF 361 and 367. Concentration on internal operations of financial institutions, especially banks.
490. **SPECIAL PROBLEMS. (1-10).** Pr., ACF 363 and senior standing. Advanced individual research and study in finance under guidance of a faculty member.

GRADUATE

561. **CONCEPTS OF MANAGERIAL FINANCE (5).** Pr., MH 140 and ACF 513 or equivalent and consent of the Director of the MBA program, School of Business. An accelerated course in finance and business applications.
620. **RISK MANAGEMENT IN THE BUSINESS ENTERPRISE (5).** Pr., EC 501 or equivalent or COI. An analysis of the appropriate methods used by businesses and other organizations to manage static risk.
650. **SEMINAR (1-10).** Pr., COI. Intensive study and analysis of accounting and finance problems.
651. **ADVANCED MULTINATIONAL FINANCIAL MANAGEMENT (5).** Pr., ACF 561 or equivalent, and COI. Finance related problems and policies of the multinational firm; emphasizing taxes, accounting, exchange risk, and capital budgeting.
663. **ADVANCED CORPORATION FINANCE (5).** Pr., ACF 561 or equivalent. Intensive study of theory and problems of business finance from a decision-making, internal, problem-solving point of view.
665. **CASES IN FINANCIAL MANAGEMENT (5).** Pr., ACF 663. The application for formal analytical techniques to practical business situations requiring financial decisions through use of the case approach.
667. **ADVANCED CONSUMER CREDIT (5).** Pr., ACF 663. Consumer credit and its impact on financial institutions and the economy.
669. **ADVANCED FINANCIAL MARKETS AND INSTITUTIONS (5).** Pr., ACF 663. Financial institutions and markets and their impact on business decisions.
690. **SPECIAL PROBLEMS (1-15).** Pr., COI. Variable content in the finance areas.

Aerospace Engineering (AE)

Professors Williams, Head, Cochran, Cutchins, Haneman, Martin, and Storzini
Associate Professors Burkhalter, Cochran, and Nichols
Assistant Professor Foster

203. **AEROSPACE FUNDAMENTALS (3). LEC. 2, LAB. 3.** Pr., MH 161. Aerospace concepts and terminology. General schemes and designs of aerospace systems and applications of computers to same. Duplicate credit will not be given for AE 203 and IE 204 or similar courses which include FORTRAN programming instruction.
300. **AEROSPACE ANALYSIS I (3).** Pr., MH 265. Special methods and notations used in Aerospace Engineering.
302. **AIRLOADS (4). LEC. 3, LAB. 3.** Pr., ME 340. Application of the basic equations of fluid dynamics to the prediction of pressure distribution, wing loading and hinge moments. Propeller design and selection.
303. **THEORETICAL AERODYNAMICS I (4).** Pr., ME 340 and AE 300. Fundamental analysis of aerodynamics, potential flow theory. Correlation of potential flow theory with experimental results.
304. **THEORETICAL AERODYNAMICS II (4). LEC. 3, LAB. 3.** Pr., AE 303. Fundamental principles of compressible flow including subsonic, transonic, supersonic, and hypersonic aerodynamics. High speed wind tunnels and laboratory techniques.
305. **FLIGHT PERFORMANCE (3).** Pr., AE 302. Equations of motion and solution techniques for vehicle performance analysis including effects of propulsion system and aerodynamic variations.
307. **AEROSPACE STRUCTURES I (5). LEC. 4, LAB. 3.** Pr., ME 207. Basic structural analysis. Shear and bending in monocoque structures. Deflections of beams and frames. Column and plate buckling. The laboratory portion is devoted to experimental techniques in stress analysis.
310. **AEROSPACE ANALYSIS II (4).** Pr., MH 265, ME 321. Linear and non-linear systems, linearization procedures, and linear systems analysis techniques. Other special techniques as required by advanced courses.
311. **AEROSPACE MATERIALS AND METHODS OF CONSTRUCTION (2).** Pr., AE 307. Nomenclature, coding systems, physical and structural properties, applications and fabrication techniques as applied to aerospace materials.
326. **FUNDAMENTALS OF AEROSPACE DYNAMICS (3).** Pr., AE 310. Dynamics of aerospace vehicles in moving reference frames; Eulerian formulation for the vehicle as a rigid body; Lagrangian formulation and small oscillation theory. Provides a unified basis for further studies in aircraft vibration, flight dynamics, and space flight mechanics.
330. **AEROSPACE INSTRUMENTATION (3). LEC. 2, LAB. 3.** Pr., EE 261. Basic theory and principles of operation of instrumentation used in aerospace applications. System approach in taking measurements for aerospace systems.

401. **AEROSPACE PROBLEMS I (1). LAB. 3.** Pr., EH 304 or COI, senior standing. Investigation of current aerospace problems; preparation and presentation of technical papers and reports.
409. **AEROSPACE STRUCTURES II (5). LEC. 4, LAB. 3.** Pr., AE 203 or equivalent knowledge of FORTRAN programming, AE 307, 310. A continuation of AE 307. An introduction to the finite element method. The laboratory portion is devoted to the solution of structural problems on the digital computer.
427. **ENGINEERING METEOROLOGY (3). LEC. 3.** Atmospheric composition, temperature distributions, stability-instability relationships with application to physical weather phenomena. The physics of precipitation, adiabatic charts, winds, and elementary forecasting.
439. **STATIC STABILITY AND CONTROL (4). LEC. 3, LAB. 3.** Pr., AE 304. Introduction to static stability and control of flight vehicles including laboratory techniques for determination of stability parameters.
448. **AEROSPACE DESIGN I (1). LAB. 3.** Pr., senior standing. An application of the design process oriented toward the aerospace field with emphasis on the development of creative thinking and team effort. A two quarter sequence with AE 449.
449. **AEROSPACE DESIGN II (2). LAB. 6.** Pr., AE 448. A continuation of AE 448.
491. **SPECIAL PROBLEMS (1-5 CREDIT HOURS TO BE ARRANGED).** Pr., departmental approval. Not open to graduate students.

ADVANCED UNDERGRADUATE AND GRADUATE

500. **VISCOUS AERODYNAMICS (4). LEC. 3, LAB. 3.** Pr., AE 304. Theoretical background essential to a fundamental understanding of laminar and turbulent boundary layers and their relations to skin friction and heat transfer. Experimental techniques.
501. **ADVANCED THREE-DIMENSIONAL AERODYNAMICS (3-5 CREDIT HOURS TO BE ARRANGED).** Pr., AE 304 and COI. Advanced concepts in the application of aerodynamic principles to finite wings and bodies, thickness effects, interference effects and computer simulation.
514. **EQUILIBRIUM GAS DYNAMICS (3).** Pr., COI. Basic concepts of The Equilibrium Kinetic Theory and the equilibrium real gas properties, Aero-thermodynamic fundamentals of external flows for various atmospheric flight conditions in terms of flight speeds, altitudes and vehicle geometry.
515. **JET PROPULSION (5).** Pr., coreq., AE 304 Internal aerodynamics and thermodynamics of rockets and air-breathing jet engines. Jet nozzles. Detailed analysis of flow through turbojet compressors, combustors and turbines.
516. **ROCKET PROPULSION I (3).** Pr., AE 515. Detailed analysis of the thermodynamics, gasdynamics, and design of liquid-propellant rockets.
517. **ROCKET PROPULSION II (3).** Pr., AE 515. Design and performance analysis of solid-propellant rocket motors with emphasis on internal ballistics.
520. **DYNAMIC SIMULATION (3).** Pr., AE 326. Computer techniques applied to the analysis of aerospace engineering problems using analog and hybrid computers and the digital problem-oriented language, Continuous System Modeling Program (CSMP).
521. **FLIGHT VEHICLE STRESS ANALYSIS (3).** Pr., AE 409. Stress analysis related to aircraft, missile, and space structures.
524. **NONEQUILIBRIUM GAS DYNAMICS (3).** Pr., COI. Nonequilibrium Kinetic Theory of real atmospheric gases. Applications of the thermal and chemical nonequilibrium conditions to the external flows for various flight conditions.
528. **SPACE PROPULSION SYSTEMS (5).** Pr., AE 515. Introduction to reaction engines for use in outer space vehicles. Power requirements for space missions, nuclear power systems, ion engines, magnetohydrodynamics and plasma accelerators, and photonic engines.
529. **AIRCRAFT VIBRATION AND FLUTTER (4).** Pr., AE 326, AE 409. Free, forced, and damped vibration of single and multiple degree-of-freedom systems; introduction to vibration of continuous systems; introduction to flutter theory; applications in aerospace.
532. **ASTRODYNAMICS I (3).** Pr., AE 326 or COI. Geometry of the solar system, detailed analysis of two-body dynamics and introduction to artificial satellite orbits, Hohmann transfer and patched conics for lunar and interplanetary trajectories. Elements of orbit determination.
533. **ASTRODYNAMICS II (3).** Pr., AE 532. Elements of general perturbation theory; n-body formulation and introduction to 3-body problem; introduction to powered flight analysis and space flight guidance.
534. **AEROSPACE SYSTEMS ANALYSIS (3).** Pr., AE 310. Modeling of system elements, analysis of systems undergoing various motions connected with flight, and introduction to optimal linear control systems.
535. **ELEMENTS OF V/STOL FLIGHT (3).** Pr., AE 303 or COI. The analysis of methods for generating high lift at low vehicle forward speeds.
536. **ROTARY WING AERODYNAMICS (3).** Pr., AE 305. Aerodynamics and flight characteristics of the rotary wing aircraft.
541. **DYNAMIC STABILITY AND CONTROL (3).** Pr., AE 326, 439, 534. Derivation of the kinematic and dynamic equations used to describe the motions of aircraft. Analysis of the stability of steady state flight conditions. Response of aircraft to actuation of controls.
542. **AUTOMATIC STABILITY AND CONTROL (3).** Pr., AE 541. Principles and techniques of automatic control of aircraft and missiles. Effects on design variables.

543. **FLIGHT SIMULATION (3).** Pr., AE 541 and COI. Time domain simulation to the nonlinear six-degree-of-freedom motion of aircraft. Models for aerodynamics, propulsion and control systems. Special computer techniques applied to the generation of various flight profiles.
545. **MISSILE AERODYNAMICS (3).** Pr., AE 304, AE 439. The aerodynamics of slender wing-body configurations for the low supersonic, moderate hypersonic and Newtonian continuum flow regimes. Linear and non-linear effects are considered as well as interference effects. Application to missile performance and stability for certain flight profiles.

GRADUATE

601. **ADVANCED SUPERSONIC AERODYNAMICS (5).** Pr., AE 500. A rigorous development of linearized and nonlinear fluid flow theories and application. Lifting surfaces, lifting bodies, duct flow, boundary layer effects, shock and expansion waves, and method of characteristics are considered.
602. **ADVANCED ELEMENTS OF HIGH SPEED AERODYNAMICS (5).** Pr., AE 601 or equivalent. A continuation of AE 601 to include three-dimensional wing theory; slender body theory and similarity laws for subsonic, supersonic and hypersonic flow conditions.
603. **HIGH-SPEED VISCOUS AERODYNAMICS (5).** Pr., AE 602 or equivalent. A continuation of AE 602 to include effects of conductivity and viscosity on aerodynamic properties.
604. **ADVANCED LOW SPEED AERODYNAMICS (3-5).** Pr., AE 300, 303. Theoretical analysis of two dimensional airfoils. Joukowski transformations, Theodoresen's theory and other techniques for determining flow characteristics over any two-dimensional airfoil. Finite wing analysis, lift distribution on finite wings.
605. **AEROELASTICITY (3-5).** Pr., AE 529. May be taken more than one quarter, not to exceed 10 hours. General formulation of aeroelastic problems, divergence, flutter and loss of control, dynamic stresses, panel flutter.
606. **AEROSPACE STRUCTURAL DYNAMICS (3-5).** Pr., AE 529. Advanced theory of matrix structural analysis with applications to dynamics of flight.
609. **ADVANCED AERO-STRUCTURES (3).** Pr., AE 529. Vibrations of solids and wave propagation, introduction to general methodology and thermodynamics of solids, derivation of large-deflection equations, principles of basic solids investigations, and application to aerospace structures.
610. **ADVANCED VIBRATIONS PHENOMENA (3-5).** Pr., AE 529. Aerospace applications of dynamic phenomena measurement including linear varying differential transformers, piezoelectric accelerometers, dynamic force gages, and strain gages. On line use of hybrid and digital computers for data analysis and combined experimental simulation involving both experiment and computer. Use of various types of shakers in dynamic tests.
611. **THRUST GENERATION (5).** Pr., AE 515. Aerothermodynamics of compressible flow, chemical propellant characteristics, heat transfer in fluid flow, nuclear propulsion.
612. **AEROTHERMOCHEMISTRY OF PROPULSION (3-5).** Pr., AE 611 or COI. Selected topics emphasizing interaction between internal aerodynamics and combustion phenomena in air-breathing jet engines and rockets. Various techniques of establishing equilibrium composition and flame temperatures; comparison of frozen and equilibrium flow in nozzles; effects of condensed phases; supersonic combustion.
613. **ADVANCED AIR-BREATHING PROPULSION (3-5).** Pr., AE 611 or COI. Selected topics emphasizing interaction between external aerodynamics and performance of air-breathing jet engines, boundary layer effects in diffusers and compressors, and detailed analysis of various techniques of minimizing detrimental effects, compressor and turbine matching in turbojets, cascade aerodynamics, and variable area jet nozzles.
615. **HYPERSONIC FLOW THEORY (3-5).** Pr., AE 500, coreq., MH 461. May be taken more than one quarter, not to exceed 15 hours. Hypersonic continuum theory, governing equations of motion for two and three dimensional flows, hypersonic small disturbance theory, viscous effects. Real gas effects in gas dynamics and rarefied gas flows, basic heat transfer concepts.
616. **REAL GAS DYNAMICS (3-5).** Pr., COI. May be taken more than one quarter, not to exceed 15 hours. A microscopic approach to gas dynamics based on quantum mechanical models and statistical techniques.
617. **MOLECULAR THEORY OF AERODYNAMICS (3-5).** Pr., COI. May be taken more than one quarter, not to exceed 15 hours. Free molecular, near-free-molecular, and transition flows of neutral gases are considered. Basic equations are developed and selected geometries are treated in detail.
619. **DYNAMICS OF FLIGHT (5).** Pr., AE 541 or COI. Derivations of equations of motion for variable-mass and flexible flight vehicles; small-disturbance theory and the linearized solutions of the general equations of unsteady motions, aerodynamic derivative, derivatives analysis, aerodynamic transfer functions, dynamic stability of uncontrolled longitudinal and lateral motions.
620. **FLIGHT DYNAMICS OF HYPERVELOCITY VEHICLES (3-5).** Pr., COI. May be taken more than one quarter, not to exceed 15 hours. Flight dynamics of steady and unsteady flight at hypersonic speeds, great-circle and minor-circle flight, re-entry, stability derivatives in hypersonic flow. Linearization of equations is investigated; static stability problems of hypervelocity vehicles are discussed.
632. **ADVANCED ASTRODYNAMICS (3-5).** Pr., AE 533 or COI. May be taken more than one quarter, not to exceed 15 hours. Selected topics from indirect and direct methods of trajectory optimization, trajectory isolation techniques, special and general perturbation theories, oblate earth problem, three body problem, space craft rotational motion, mission analysis methods, and new research developments.
635. **ION AND PLASMA PROPULSION (5).** Pr., COI. Basic physical and gas dynamic processes underlying methods for electrical acceleration of ionized gas flows appropriate to electrothermal propulsion, electrostatic propulsion, electromagnetic propulsion.

639. **PARTICLE KINETICS OF PLASMAS (3-5).** Pr., COI. May be taken more than one quarter, not to exceed 15 hours. Gaseous plasmas based on the theory of individual particle kinetics. Emphasis will be placed on the development of basic concepts with sufficient generality to allow treatment of non-equilibrium problems of interest in aerospace research.
640. **MAGNETO-GAS DYNAMICS (5).** Pr., COI. Review of electrodynamics, Maxwell stresses, field and momentum-energy tensors. Thermo-dynamics of fluids in electromagnetic fields. Equations of motion of a conducting gas. Discussion of typical flow problems. Consideration of microscopic aspects of plasma flows.
645. **SHOCK TUBE THEORY AND TECHNIQUES (5).** Pr., COI. Shock wave theory in real and perfect gases. expansion wave theory, reflected shock wave theory. Basic shock tube equations; effects of area change, driver types and characteristics. Non-ideal behavior in shock tubes, diaphragm opening effects, boundary layer effects, shock wave attenuation. Testing time derivation. Shock tube techniques and measurements.
646. **PLASMA DIAGNOSTICS (3-5).** Pr., COI. May be taken more than one quarter, not to exceed 15 hours. Theoretical and applied studies of techniques for the measurement of plasma properties. The application of these techniques to aerospace research and testing.
690. **SEMINAR. CREDIT TO BE ARRANGED.** May be taken more than one quarter. Provides weekly lectures on current developments in aerospace sciences by staff members, graduate students, and visiting scientists and engineers.
691. **DIRECTED READING IN AEROSPACE ENGINEERING (1-5).** May be taken more than one quarter.
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.
799. **RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.

Aerospace Studies (AF)

- 101-102-103. **THE AIR FORCE TODAY (1-1-1). LEC. 1, LAB. 1.** The history, organization and mission of the United States Air Force. Introduction to strategic offensive/defensive forces, general purpose forces, and aerospace forces.
- 201-202-203. **THE DEVELOPMENT OF AIR POWER (1). LEC 1, LAB.1.** Development of air power over the past sixty years. Focusing on technological change and concepts of employment.
- 301-302-303. **AIR FORCE MANAGEMENT AND LEADERSHIP (3-3-3). LEC. 3, LAB. 1.** Fundamentals of communication skills, the management process, and Air Force leadership.
- 401-402-403. **NATIONAL SECURITY FORCES IN CONTEMPORARY AMERICAN SOCIETY (3-3-3). LEC. 3, LAB.1.** Examination of national defense policy and civil-military relationship. Preparation for initial active duty.

Agricultural Economics and Rural Sociology (AEC) (RSY)

Professors Yeager, Head, Bell, Clonts, White, and Wilson
Associate Professors Adrian, Dunkelberger, Hardy, Martin, McCoy, and Stallings
Assistant Professors Jolly, Molnar, Sullivan and Vanlandingham
Joint Appointee: Associate Professor Adams, Sociology

Agricultural Economics (AEC)

202. **AGRICULTURAL ECONOMICS I (5).** All quarters. Economic principles with emphasis on farm-related production, marketing, prices, consumption, taxation, credit, finance, public policies and tenure. Treats utilization of land, labor, and capital. Credit not allowed in this course and EC 200.
206. **AGRICULTURAL ECONOMICS II (5).** Pr., AEC 202 or equivalent. Continuation of economic principles with emphasis toward micro-economic concepts relating to farm firm. Credit not allowed in this course and EC 202.
301. **AGRICULTURAL MARKETING (5).** Pr., AEC 202 or equivalent. Principles and problems in marketing farm products. Analysis of marketing functions, services, and costs; reducing costs and improving marketing efficiency. Marketing methods and distribution channels of major farm commodities. Market institutions and operation.
302. **FARM RECORDS AND TAX MANAGEMENT (5).** Pr., AEC 202 or equivalent. Types and uses of farm records and accounts with emphasis on analyzing records to improve net farm income. Interpretation of income tax regulations and preparation of farm tax returns with emphasis on tax management.
303. **AGRICULTURAL COOPERATIVES (3).** Pr., AEC 202. Principles and problems of organizing and operating farmers' cooperative buying and selling associations.
304. **AGRICULTURAL FINANCE (3).** Pr., AEC 202. Economic problems and policies in financing agriculture.
305. **FARM APPRAISAL (3).** Pr., AEC 202. Theory of land values; techniques on farm land and building appraisals for different purposes; relationships of land use, buildings, land titles, farm prices, taxes, and interest rates to land values; evaluation of appraisal methods and forms currently in use.
307. **AGRICULTURAL LAW (5).** Legal environment of agriculture. Recognition of legal problems associated with property ownership, contracts, torts, financing, estate planning and environmental controls and restrictions.

490. **SENIOR SEMINAR (1). LEC. 1.** Pr., senior standing. Pass-fail basis. Current developments in Agricultural Economics; the role of Agricultural Economics in the general economy.
499. **DIRECTED STUDIES IN AGRICULTURAL ECONOMICS (1-5).** Pr., COI, junior standing. Individualized work and study in consultation with faculty member on subject of mutual concern. May include directed readings, research, analysis of an employment experience or a combination. Employment experience with a variety of agribusiness and agencies may serve as the focus.

ADVANCED UNDERGRADUATE AND GRADUATE

501. **FARM MANAGEMENT (5).** Pr., AEC 202 or equivalent. Principles of economics applied to agriculture, uses of farm records to improve management of the farm; developing enterprise budgets and use in preparing a profit-maximizing farm plan.
503. **AGRICULTURAL PRICES (3).** Pr., AEC 202 or equivalent. Principles and factors in the pricing process with special reference to agricultural products and markets. Functions of prices and principles of supply and demand in price determination.
505. **AGRICULTURAL POLICY (3).** Pr., AEC 202 or equivalent. Concepts, objectives and operation of public policies affecting agriculture. Development of agricultural policies in the United States.
509. **RESOURCE ECONOMICS (5).** Pr., AEC 202 or equivalent. Principal economic and institutional factors affecting man and his use of land. Supply, demand, and future requirements for land. Property rights, land use planning, zoning, taxation and other social controls affecting land utilization.
510. **AGRICULTURAL BUSINESS MANAGEMENT (3).** Pr., AEC 202 or equivalent. Principles and problems in acquiring, organizing and operating successful agricultural businesses, capital requirements, factors affecting location and growth, and measures of technical and economic efficiency in organization and operation, practices in buying, pricing, and merchandising, management problems and policies in financing, personnel, and public relations.
512. **ECONOMIC ASPECTS OF WATER RESOURCES MANAGEMENT (5).** Supply, demand, and use of water resources including economic, legal, and political dimensions. Economics of management of water resource use and conservation in terms of present and future supplies and needs. Both public and private water resources will be considered.
560. **INTRODUCTION TO ECONOMETRICS (5).** Pr., MH 161 or equivalent, MN 274 or equivalent, and AEC 202 or equivalent. Formulation of elementary economic models using economic theory and mathematics with certain basic assumptions or axioms. Mathematical tools used in economic analysis.

GRADUATE

601. **ADVANCED FARM MANAGEMENT (5).** Advanced theory and application of farm management principles and economic concepts in agriculture. Organization, operation, and management of various types of farms. Optimum utilization of available resources on individual farms.
602. **ADVANCED AGRICULTURAL PRICES (5).** Pr., MN 274. Methods of price analysis, separation of fluctuations from price trends, measurement of changes in supply and demand of farm products. Prices, price trends, price cycles, and other price structures.
603. **ADVANCED LAND ECONOMICS (5).** Man and his use of land as related to institutional factors. Economics of natural resource use, economic feasibility, benefit-cost analysis, economics of environmental control, and factors related to rural and urban land use.
605. **ADVANCED AGRICULTURAL MARKETING (5).** Theory of marketing with emphasis on its application to methods used and problems faced in marketing farm products. Objectives in agricultural marketing.
608. **ECONOMICS OF AGRICULTURAL PRODUCTION (5).** Pr., EC 551. Resource allocation and efficiency of production. Production and efficiency in the firm, between firms, and between Vagiculture and other industries. Influences on agricultural resource allocation and efficiency of risk and uncertainty.
610. **QUANTITATIVE RESEARCH TECHNIQUES IN AGRICULTURAL ECONOMICS (5).** Introduction to basic quantitative techniques with emphasis on linear programming and its extensions. Concepts of input-output analysis, Markov chain analysis, dynamic programming, inventory control, queuing processes, replacement and game theory are also introduced. General theoretical background and associated computational procedures are used for presentation of each technique.
611. **ECONOMIC DEVELOPMENT (5).** Conceptual and empirical analysis of economic development with emphasis on the lesser developed areas and countries. Analysis of financial and technical aid to other countries and case studies of development problems will be incorporated.
616. **RESOURCE ECONOMICS, POLICIES AND PROGRAMS (5).** Impact of resource development on economic growth. Effect of taxation and tax policies. Interaction between technological change, resource use, and economic growth. Analysis of current policies and programs.
620. **DIRECTED READINGS IN REGIONAL PLANNING (5).** Assigned readings and pursuant discussions on delineation of economic areas, resource use and allocation, economic regions, watershed development, planning legislation, zoning, housing, land use restrictions, conservation, and recreation.
621. **REGIONAL PLANNING ANALYSIS (5).** Theories of regions and problems of multi-jurisdictional planning. Analysis of metro-area and regional planning by states. Comprehensive planning by agencies such as TVA, Corps of Engineers, and Appalachian Regional Commission. Regional planning and intergovernmental relations.

- 625. **ECONOMICS OF AQUACULTURE (5).** Pr., AEC 202 or COI. Theory and application of economic principles of production, marketing, and consumption applied to aquaculture. Role of aquaculture in economic development.
- 670. **RESEARCH METHODS IN AGRICULTURAL ECONOMICS (3).**
- 680. **SPECIAL PROBLEMS IN AGRICULTURAL ECONOMICS. CREDIT TO BE ARRANGED.**
- 690. **SEMINAR (1-1-1), FALL, WINTER, SPRING.**
- 699. **RESEARCH AND THESIS. CREDIT TO BE ARRANGED.**

RURAL SOCIOLOGY (RSY)

- 261. **RURAL SOCIOLOGY (5).** Basic sociological concepts and principles as applied to life in the rural community. Special attention given to the culture, social organization, and social problems of rural people in the United States, and in the South in particular. Credit not allowed in this course and SY 201.
- 362. **COMMUNITY ORGANIZATION (5).** General elective. Understanding the principles of community organization and effective citizenship. Survey of institutions, organizations, and agencies interacting to meet community needs.
- 370. **METHODS OF SOCIAL RESEARCH (5).** Pr., RSY 261 or SY 201. Principal methods of data collection and analysis in sociological research.
- 371. **APPLIED RESEARCH METHODS AND PROGRAM EVALUATION (3).** Basic social science research techniques used in needs assessment studies and program evaluations. Fundamentals of social surveys, field experiments, demographic analyses and applications, principles, and strategies of evaluation. Credit not allowed in this course and in RSY or SY 370.
- 499. **DIRECTED STUDIES IN RURAL SOCIOLOGY (1-5).** Pr., COI, junior standing. Individualized work and study in consultation with faculty member on subject of mutual concern. May include directed readings, research, analysis of an employment experience or a combination. May be used to complement and expand on an employment experience.

ADVANCED UNDERGRADUATE AND GRADUATE

- 541. **EXTENSION PROGRAMS AND METHODS (5).** An in-depth consideration of extension orientation in adult and continuing education in U.S. and developing nations. The Cooperative Extension Service is analyzed as an educational institution. Fundamental steps in program development and evaluation.
- 561. **RURAL SOCIAL ORGANIZATION (5).** Pr., RSY 261 or SY 201. Nature of rural social organizations with emphasis on their structure, function and change. Extent to which organizations meet needs of rural people and principles of improving effectiveness.
- 562. **SOCIOLOGY OF COMMUNITY DEVELOPMENT (5).** Pr., RSY 261 or SY 201. Various approaches to development of human resources and planning of changes within the total community. Development in different types of communities in the U.S. and world is considered with emphasis on small population centers.
- 565. **SOCIOLOGY OF NATURAL RESOURCES AND THE ENVIRONMENT (3).** Interaction between people's attitudes, behaviors and social relationships, and the natural environment. Related topics include human ecology, agriculture and the environment, social behavior in outdoor recreation settings, energy and social structure, social impact assessment, and the social organization of environmental management.

GRADUATE

- 661. **SOCIOLOGY OF REGIONS (3).** Social and demographic phenomena having implication for regional planning and development with emphasis on Southern region and subregions. Intra and inter-regional influences, socio-cultural structure, value orientations, population, changes and trends, and metropolitanization.
- 662. **SOCIAL SYSTEMS AND COMMUNITIES (3).** Interrelationship of institutions and organizations within the community and to large societal systems—regional and national. Emphasis on small towns and metropolitan centers relative to planning community change.
- 670. **RESEARCH METHODS IN SOCIOLOGY (5).** Quantitative and qualitative procedures for obtaining social data using surveys, direct observation and secondary sources.
- 680. **SPECIAL PROBLEMS IN RURAL SOCIOLOGY. CREDIT TO BE ARRANGED.**
- 699. **RESEARCH AND THESIS. CREDIT TO BE ARRANGED.**

Agricultural Engineering (AN)

Professors Turnquist, Head, Johnson, and Renoll
Associate Professors Busch, Flood, Hill, Koon, Rochester, and
Schafer, Taylor, and Gill
Adjunct Associate Professors Bailey, Burt, and Hendrick

Courses For Engineers

101. **INTRODUCTION TO AGRICULTURAL ENGINEERING (2). LEC. 1, LAB. 3.** Perspectives on the agricultural engineering profession, attaining professional status and the engineer's approach to problem solving. Emphasis on basic quantities used in physical systems.
102. **AGRICULTURAL ENGINEERING PRINCIPLES (2). LEC. 1, LAB. 3.** Engineering concepts and principles applied to agricultural problems. Evaluation and analysis of engineering problems, data acquisition, engineering measurement and notation, and conceptual design.
301. **MECHANICS OF FARM MACHINES (3). LEC. 2, LAB. 3.** Pr., ME 321, MH 265, IE 204. Basic concepts and engineering principles of farm machinery, including basic design, power needs and their measurement, functional and economic analysis, utilization and management, testing, and safety as related to farm machines.
302. **MECHANICS OF TRACTOR POWER (3). LEC. 2, LAB. 3.** Pr., MH 265, ME 301, 321, IE 204. Basic concepts and engineering principles of the farm tractor, including mechanics of the tractor, stability, traction, weight transfer, thermal efficiency, energy sources, economics, safety, testing and power measurement as related to tractors and power units.
303. **SOIL AND WATER ENGINEERING I (3). LEC. 3.** Pr. CE 308 or ME 340 and IE 204. Coreq. AN 303L or CE 201. Rainfall-runoff relationships. Soil erosion mechanics and control methods. Upstream flood control analysis and design.
- 303L. **SOIL AND WATER ENGINEERING I LAB (1). LAB 3.** Coreq. AN 303. Surveying procedures and applications to soil and water problems including observation and design of conservation structures.
304. **IRRIGATION AND DRAINAGE ENGINEERING (3). LEC. 2, LAB. 3.** Pr., CE 308 or ME 340, IE 204. Soil-Water-Plant relationships. Theory and design of irrigation systems. Principles of agricultural drainage.
305. **AGRICULTURAL PROCESSING ENGINEERING (3). LEC. 3.** Pr., ME 301, 340. Introduction to process engineering, fundamental concepts, theory of unit operations such as pumps, fans, size reduction, cleaning, bulk movement, and heat transfer and mass transfer.
306. **ELECTRICAL SYSTEMS IN AGRICULTURE (3). LEC. 3.** Pr., EE 261. Coreq., EE 263. Application of electrical power, equipment and control devices to agricultural systems. Special emphasis on safe and efficient power distribution, motor selection and performance, and theory and performance of sensing and control devices.
307. **AGRICULTURAL STRUCTURES DESIGN I (3). LEC. 2, LAB. 3.** Pr., ME 207. Analysis and design of structural systems of agriculture.
401. **FOREST MACHINERY (3). LEC. 3.** Pr., AN 301, AN 302. Power requirements, design aspects, hydraulic systems, testing, rating and use of forest machinery. Vehicle - Terrain relationships.
402. **FOREST ROADS AND STRUCTURES (3). LEC. 2, LAB. 3.** Pr., ME 207, FY 304. Design, construction and maintenance of secondary and temporary road systems and bridges. Design and construction of light buildings.
- 410-411. **SPECIAL PROBLEMS (3-3).** Pr., Faculty adviser approval and AN 301-307. Individual student endeavor supervised by instructor involving special Agricultural Engineering topics to which the engineering electives selected by the student will be complementary.

Courses For Non-Engineers

250. **WEATHER, CLIMATE AND AGRICULTURE (4). LEC. 3, LAB. 3.** An introduction to the elements of atmospheric science and how they combine to create variations in world climate. The relation of climate and climatic variation to agriculture with emphasis on the available sources of climatic information.
350. **SOIL AND WATER TECHNOLOGY (5). LEC. 4, LAB. 3.** Technical application of soil and water resources management. Irrigation system planning and equipment selection.
351. **AGRICULTURAL MACHINERY TECHNOLOGY (5). LEC. 4, LAB. 2.** Agricultural machinery: utilization, management, selection, and economic justification.
352. **TRACTOR AND ENGINE TECHNOLOGY (5). LEC. 4, LAB. 2.** Tractors and engines. Operation, fuels used, size selection, utilization, and economic justification.
353. **FARM BUILDINGS TECHNOLOGY (5). LEC. 4, LAB. 3.** Selection of materials, methods of construction and functional needs of modern farm building.
354. **AGRICULTURAL PROCESSING TECHNOLOGY (5). LEC. 4, LAB. 3.** Agricultural processing systems: includes storing, drying, pelleting, mixing and automatic materials handling systems.
355. **PRINCIPLES OF FOOD ENGINEERING TECHNOLOGY (5). LEC. 4, LAB. 3.** Pr., MH 161, PS 205. Engineering concepts and unit operations used in processing and handling of food products.

357. **ENVIRONMENTAL QUALITY AND AGRICULTURE (4). LEC., 3, LAB. 3.** Pr., CH 104. Basic introduction to pollution, measurement, nutrient cycles in nature, point and non-point source pollution, treatment and utilization of animal wastes and energy recovery from agricultural residues.

ADVANCED UNDERGRADUATE AND GRADUATE

501. **AGRICULTURAL POWER AND MACHINERY DESIGN (3). LEC. 2, LAB. 3.** Pr., AN 301, 302. Design of equipment and systems to apply engineering principles to solutions of agricultural power and machinery problems. Functional requirements, safety, reliability, service conditions, power measurement, useful life, and creative design are combined to obtain designs for agricultural machine and power units.
503. **SOIL AND WATER ENGINEERING II (3). LEC. 2, LAB. 3.** Pr., AN 303, AN 304 or COI. Theory and design considerations of selected topics in irrigation, erosion, non-point source pollution, drainage or upstream flood control.
505. **ELECTRICAL AND PROCESSING SYSTEMS DESIGN (3). LEC. 3.** Pr., AN 305, 306. Design and layout of material handling systems, fundamental theory of particle movement, study of sensing and feed-back systems to include automatic controls and servo-mechanisms.
507. **AGRICULTURAL STRUCTURE DESIGN II (3). LEC. 3.** Pr., AN 307. Functional requirements and design of animal shelters and agricultural storage buildings.
517. **PHOTOGRAMMETRY (5). LEC. 3, LAB. 6.** Pr., FY 314. (Same course as FY 517). Use of aerial photographs in forestry. Particular emphasis is placed on specifications for forestry photography, basic map control, planimetric mapping, timber type mapping, and timber volume estimation.
532. **ENGINEERING IN AGRICULTURE I—AGRICULTURAL MACHINERY (3). LEC.-DEM. 4.** Pr., graduate standing. The utilization of modern agricultural machinery on the farm with emphasis on safety, management, costs, economic justification, and principles of operation.
534. **ENGINEERING IN AGRICULTURE II—AGRICULTURAL POWER (3). LEC.-DEM. 4.** Pr., graduate standing. Farm tractor and power units used on the farm; includes the basic principles of operation with major interest toward lubrication, costs, operational problems, safety and a comparison of gasoline, Diesel, and LP gas fuels, and units.

GRADUATE

601. **ADVANCED SMALL WATERSHED HYDROLOGY (4).** Pr., AN 503, CE 512. Hydrograph synthesis, Mathematical modeling of runoff and streamflow. Probability analysis of hydraulic events. Design of upstream systems for flood and erosion control and water supply.
602. **ADVANCED FARM POWER AND MACHINERY (5).** Pr., AN 501. Principles of operation and analysis of design of basic machine elements, hydraulic systems and functional requirements of farm power units, agricultural machinery and materials of construction.
604. **AGRICULTURAL ENGINEERING PROBLEMS. CREDIT TO BE ARRANGED NOT TO EXCEED A TOTAL OF 5 HOURS.** Special advanced engineering and design problems.
605. **SOIL DYNAMICS OF TILLAGE AND TRACTION (3).** Pr., CE 406 or AY 555 or COI. Analysis and measurements of soil reactions, as affected by the physical properties of the soil, when subjected to forces imposed by tillage implements and traction devices. Considered are shear, cohesion, adhesion, consolidation, plasticity and abrasion soil properties.
607. **ENGINEERING PRINCIPLES OF ANIMAL ENVIRONMENT (3). LEC. 3.** Pr., AN 507 or COI. Design and analysis of environmental equipment and systems for control or modification of animal production. Emphasis on evaluation of environmental factors which influence total environment.
608. **SEMINAR. CREDIT TO BE ARRANGED.** Reviews and discussions of research techniques, current scientific literature and recent developments in agricultural engineering research.
610. **BIOLOGICAL AND PHYSICAL SYSTEM ANALYSIS I (3).** Pr., MH 362. Mathematical analysis and computer modeling of biological and physical systems including the formulation of differential equations with analytical and numerical solution techniques. Solutions by regression equations and by physical models. Decisions made under certainty, risk and uncertainty.
611. **BIOLOGICAL AND PHYSICAL SYSTEM ANALYSIS II (3).** Pr., AN 610. A continuation of AN 610.
699. **RESEARCH AND THESIS. CREDIT TO BE ARRANGED.** May be taken more than one quarter.
799. **DOCTORAL RESEARCH AND DISSERTATION. CREDIT TO BE ARRANGED.**

Agronomy and Soils (AY)

Professors Ward, Head, Adams, Cope, Donnelly, Hajek,
Hiltbold, Hood, Hoveland, Johnson, and King
Associate Professors Dickens, C. Evans, Touchton, and Walker
Assistant Professors Dane and Odum

200. **CROP PRODUCTION (5). LEC. 4, LAB. 2.** Winter. Production of crops used by man for food, feed and fiber including identification of crop plants, cultural practices, and processing.

301. **PRINCIPLES OF GRAIN PRODUCTION (5). LEC. 4, LAB. 2.** Winter, Spring. Fundamental factors involved in the economic production of corn, small grains, grain sorghum, peanuts and soybeans.
304. **GENERAL SOILS (5). LEC. 4, LAB. 2.** Pr., CH 105 and 105L or CH 207. Winter, Spring. The formation, classification, composition, properties, management, fertility, and conservation of soils in relation to the growth of plants.
305. **GENERAL SOILS (5). LEC. 4, LAB. 2.** Pr., CH 103-104. Winter. The formation, classification, composition and properties of soils and their influence on vegetative growth and development on forest lands. Open only to students in Forestry.
307. **GENERAL SOILS (5). LEC. 4, LAB. 2.** Pr., CH 103-104. Fall, Spring. The general field of soils including genesis, classification and fertility.
310. **EARTH SCIENCE (5).** Materials of the earth; forces that shape and sculpture the earth's surface, including weathering, water, soil formation and erosion; soil geography, and historical geology. (Not open to students in School of Agriculture and Agricultural Education. Credit toward degree may not be earned in both this course and a General Soils course.)
312. **PRINCIPLES OF WEED SCIENCE (5). LEC. 4, LAB. 2.** Pr., BI 102 and CH 104. Fall. Basic weed identification and biology, methods of weed management, and classification of herbicides and how they are used in weed control.
315. **TURFGRASS MANAGEMENT (5). LEC. 3, LAB. 4.** Pr., BY 102. Fall. The management of recreational and home area turfgrass will be studied and will include the establishment and maintenance of turf and the effect of light, traffic, soil fertility, and water on its growth.
321. **FATE OF PESTICIDES IN THE ENVIRONMENT (3). LEC. 2, LAB. 3.** Pr., BI 101-102, CH 207 or equivalent. Spring. Pesticide absorption, translocation by plants and effects on plant processes. Behavior of herbicides in soils and effects on soil microorganisms. Mechanisms of herbicide inactivation and the basis for herbicide selectivity.
399. **PROBLEMS IN WEED SCIENCE (1). LEC. 1.** Pr., COI. Fall. Conferences, problems, and assigned reading in weed science.
401. **PRINCIPLES OF FORAGE PRODUCTION (5). LEC. 4, LAB. 2.** Pr., junior standing. Fall, Spring. Grass and legume forage crops. The crops are considered from the standpoint of (a) pasture crops, (b) hay and silage crops, (c) soil improving crops.
403. **PESTICIDES (5). LEC. 4, LAB. 3.** Pr., CH 207. Winter. The chemistry, mode of action, activity, formulations, applications, and legal aspects of pesticides and pesticide applications.
404. **FIBER AND OIL CROPS (5). LEC. 5.** Pr., junior standing. Winter. Most of the time will be devoted to cotton, soybeans and peanuts with a limited amount of time devoted to other fiber and oil crops.
407. **CONCEPTS OF PEST MANAGEMENT (5). LEC. 4, LAB. 3.** Pr., COI. Spring. Pest management technology and philosophy.
420. **SOIL JUDGING (3). LEC. 1 LAB. 4.** Pr., AY 304, 305, or 307. Description, evaluation and interpretation of soil profile characteristics.
422. **FACTORS LIMITING CROP PRODUCTION (3). LEC. 3.** Winter. Factors influencing the production of crops including climate, water, soils. The role of plant and animal pests and the limitations created by the attitudes and mores of people.
490. **SENIOR SEMINAR (1). LEC. 1.** Pr., junior standing. Winter. S-U graded. Current developments and the role of crop and soil sciences.
499. **SPECIAL PROBLEMS (1-5). CREDIT TO BE ARRANGED.** Pr., departmental approval, junior standing. Not open to graduate students. Students will work under the direction of a staff member on special problems in crop or soil science.

ADVANCED UNDERGRADUATE AND GRADUATE

502. **SOIL FERTILITY (5). LEC. 5.** Pr., AY 304, 305 or 307. Spring. Lectures, demonstrations and problems illustrate principles of soil fertility as related to fertilizer practices and crop production. An advanced course, required of all students majoring in Agronomy and Soils. Either AY 502 or AY 507, but not both, may be used to satisfy the minimum requirement for the Master's degree.
506. **FERTILIZERS AND SOIL TESTING (5). LEC. 4, LAB. 2.** Pr., AY 304, 305 or 307. Winter. Manufacture and properties of fertilizer materials; properties and formulation of fertilizer mixtures; relative efficiency of various plant nutrient sources; principles and methods of soil testing and plant tissue testing.
507. **SOIL MANAGEMENT (5). LEC. 5.** Pr., AY 304, 305, or 307. Summer. Physical, chemical and biological properties of soils and their management. An advanced course designed for students in Agricultural Education. Either AY 502 or AY 507, but not both, may be used to satisfy the minimum requirement for the Master's degree.
508. **SOIL RESOURCES AND CONSERVATION (5). LEC. 4, LAB. 2.** Pr., AY 304, 305 or 307. Fall. Soils as a natural resource for land-use planning; their classification and management for crop production, recreation, and urban and industrial development.
509. **SEED PRODUCTION (3). Pr., AY 201, or 401.** Spring, odd years. Methods and factors affecting production, storage, and processing seed.
510. **METHODS OF PLANT BREEDING (5). LEC. 4, LAB. 2.** Pr., ZY 300. Fall, even years. A general course in the principles and methods of plant breeding.

- 514. PRINCIPLES AND USE OF HERBICIDES IN CROP PRODUCTION (5). LEC. 4, LAB. 2.** Pr., CH 104. Fall. Principles and use of herbicides in agronomic crops. Acquaints the students with methods of application including equipment, time of application, methods of incorporation and formulation of herbicides. The fate of herbicides in soil and the ecological impact on succeeding plant species.
- 515. SOIL MORPHOLOGY (5). LEC. 3, LAB. 4.** Pr., AY 304, 305 or 307. Spring. Physical, chemical and mineralogical properties of soils are studied in relation to their classification for engineering and agricultural uses.
- 516. ADVANCED TURFGRASS MANAGEMENT (5).** Pr., AY 304, 315, BY 306. Spring, even years. Factors affecting the grass plant as a component of a dynamic turf community. Influence of soil chemical and physical conditions, management practices and climate will be discussed. Both theoretical and practical aspects of turf cultural practices will be discussed along with design and construction of athletic turf areas.
- 517. CROP QUALITY (5) LEC. 5.** Pr., AY 201, or 401. Spring. Quality of food, feed and fiber crops as regulated by genetic potentials, environment, management and utilization.
- 519. SOIL INTERPRETATIONS FOR PLANNING (5).** Pr., COI. Characteristics that significantly affect soil response under various uses. (Not open to students in School of Agriculture or Agricultural Education.)
- 530. SOIL CHEMISTRY (5). LEC. 3, LAB. 4.** Pr., AY 304, 305, or 307. Winter. An introduction to the basic soil chemical properties of mineral composition, weathering, absorption, ion exchange, acidity, alkalinity, salinity and soil reactions with fertilizers, pesticides, and heavy metals.
- 555. SOIL PHYSICS (5).** Pr., AY 304. Fall. Lectures and demonstrations to illustrate fundamental physical properties of soils.

GRADUATE

- 601. AGRONOMY PROBLEMS (1-5). CREDIT TO BE ARRANGED.** Conferences, problems, and assigned reading in soils and crops, including results of agronomic research from the substations and experiment fields.
- 606. SOIL MICROBIOLOGY (5). LEC. 3, LAB. 4.** Pr., AY 502 and BY 300. Spring, odd years. Soil microorganisms and their physiological processes related to soil development and plant nutrition. The role of microorganisms affecting the chemical and physical properties of soils will be studied, with emphasis on the cyclical transformations of nitrogen, phosphorous, carbon, and sulfur.
- 608. EXPERIMENTAL METHODS (5).** Fall, even years. Experimentation in the agricultural sciences including experimental techniques, interpretation of research data, use of library references and preparation of publications; and consists of problems, assigned readings, and lectures.
- 615. SEMINAR IN GENETICS (1).** Pr., ZY 300. Reports by students and staff members on current research and the literature in the field of genetics.
- 616. ADVANCED PLANT BREEDING (5). LEC. 4, LAB. 2.** Pr., ZY 300. Winter, even years. Principles, methods, and techniques involved in plant breeding. Laboratory work will consist of studying active plant breeding programs, studying pollination techniques, and making pollinations. A term paper will be required.
- 617. EXPERIMENTAL EVOLUTION (5).** Pr., ZY 300 and AY 616. Spring, even years. The factors affecting the evolution of species.
- 618. CROP ECOLOGY (5).** Pr. BY 306 or ADS 204. Winter, even years. World population and food production problems. Origin, distribution and adaptation of crop plants as influenced by environment with emphasis on climatic factors. Lectures and reading from current literature.
- 619. ADVANCED FORAGE CROPS MANAGEMENT (5). LEC. 3, LAB. 4.** Pr., AY 401 and BY 306 or ADS 204. Winter, odd years. Principles involved in successful establishment, maintenance, and management of crops used for grazing, hay and silage. Several field trips will be made to research stations and private farms to observe management practices.
- 625. CROP PHYSIOLOGY (5). LEC. 4, LAB. 2.** Pr. BY 306, CH 208. Winter, odd years. Principles of plant physiology as related to crop yield. Current crop physiological research discussed emphasizing methods of investigation and interpretation of results.
- 654. ADVANCED SOIL FERTILITY (5).** Pr., AY 502. Spring, even years. Composition, properties and management of soils in relation to the nutrition and growth of plants.
- 655. SOIL AND PLANT ANALYSIS (5). LEC. 2, LAB. 6.** Pr., CH 206 and AY 502. Winter, odd years. Principles, methods, and techniques of quantitative chemical analysis of soils and plants applicable to soil science.
- 656. SOIL CLAY MINERALOGY (5). LEC. 4, LAB. 2.** Fall, even years. Crystal structure and properties of the important clay size minerals of soils and clay deposits combined with identification techniques involving X-ray diffraction and spectroscopy, differential thermal analysis, electron microscopy, specific surface analysis, and infrared absorption.
- 657. ADVANCED SOIL CHEMISTRY (5).** Pr., CH 507 and AY 430. Fall, odd years. Interpretation of soil properties and chemical reactions in terms of ion exchange, solubility diagrams, solution equilibria, electrochemistry, and electrokinetics of charged particles.
- 658. ADVANCED SOIL PHYSICS (5).** Pr., MH 163, PS 205-206, and AY 555. Transport phenomena in soils. Physical principles and analysis of the storage and movement of water, solutes, heat, and gases in soils.
- 690. SEMINAR (1).** Fall and Winter. Required of all graduate students in Agronomy and Soils. May be repeated for credit.
- 699. RESEARCH AND THESIS. CREDIT TO BE ARRANGED.** Research and thesis on problems related to crop production, plant breeding, soil fertility and soil chemistry.
- 799. DOCTORAL RESEARCH AND DISSERTATION. CREDIT TO BE ARRANGED.**

Animal and Dairy Sciences (ADS)

Professor Topel, Head, Cannon, Harris, Hawkins, Huffman, Parks,
Patterson, Smith, Strength, and Wiggins

Associate Professors Daron, Kuhlers, Marple, McCaskey, Rollins, and Tucker

Assistant Professors Cummins, Prince, Rahe, Schmidt, and Thomas
Instructor Cordray

110. **ORIENTATION TO ANIMAL AND DAIRY SCIENCE (1). LEC. 1.** Spring. An introduction to the departmental programs and personnel. Job opportunities for the individual trained in Animal Science.
200. **INTRODUCTORY ANIMAL & DAIRY SCIENCES (5). LEC. 4, LAB. 2.** Fall, Winter, Spring, Summer. The importance of livestock to agriculture and to the nutrition of people. Livestock terminology, selection, reproduction, nutrition, management, marketing and species characteristics of beef cattle, swine, sheep and horses.
201. **INTRODUCTION TO FOOD SCIENCE AND TECHNOLOGY (5). LEC. 4, LAB. 2.** Fall. Principles of major food processing methods, concepts of food quality, nutrition, sanitation, packaging, food safety, and food laws pertinent to wholesome, safe food production.
205. **LIVESTOCK PROMOTION AND MERCHANDISING (2). LAB. 6.** Pr., ADS 200. Spring. Showing, fitting, public display, sales management, and advertising as it relates to the promotion and merchandising of cattle, swine and horses.
220. **ANIMAL BIOCHEMISTRY AND NUTRITION (5). LEC. 5.** Pr., CH 104. Fall, Winter, Spring, Summer. Principles of animal nutrition and biochemistry and a study of nutrients and their utilization by animals.
260. **GROWTH AND BODY COMPOSITION (4). LEC. 2, LAB. 4.** Winter, Spring. Prenatal and postnatal growth of muscle, fat, and bone of meat animals; the evaluation of body composition, quality, and yield grading; the pricing of live animals and their carcasses.
315. **HERD HEALTH MANAGEMENT (5).** Pr., BY 300 and ZY 316 or equivalent. Spring. Prevention and control of the major diseases of farm animals and development of herd health programs.
320. **FEEDS AND FEEDING (4). LEC. 3, LAB. 2.** Pr., ADS 220. Fall, Winter, Spring. Characteristics of feedstuffs and general comments about their processing. Principles and practices of balancing and compounding of rations for beef and dairy cattle, horses, sheep, swine and pets.
330. **LIVESTOCK SELECTION (3). LEC. 1, LAB. 4.** Pr., ADS 200. Winter. Theory and practice in the use of visual appraisal and performance records in the selection of beef and dairy cattle, swine, horses, and sheep.
331. **MEAT SELECTION AND GRADING (3). LEC. 1, LAB. 4.** Spring. The development of grading standards and application of federal grades to lamb, pork and beef carcasses, comparative evaluation of carcasses and wholesale cuts. Some labs in nearby processing plants.
350. **ANIMAL BREEDING (5). LEC. 4, LAB. 2.** Pr., ZY 300. Fall, Winter. Application of population genetics to the improvement of cattle, sheep and swine. Studies of different systems of selection and mating and their related efficiencies for livestock improvement.
361. **REPRODUCTIVE PHYSIOLOGY (5). LEC. 4, LAB. 2.** Pr., ZY 316. Winter. Comparative anatomy, physiology, and endocrinology of animal reproduction and lactation; techniques involved in the artificial insemination and pregnancy testing of farm animals. Applications of these principles to improving the efficiency of livestock.
362. **ARTIFICIAL INSEMINATION OF FARM ANIMALS (2).** Winter. Techniques involved in artificial insemination and pregnancy testing of farm animals. Application of these techniques to reproductive systems of livestock.
370. **MEAT SCIENCE (5). LEC. 4, LAB. 3.** Fall, Winter. Fundamentals of slaughter, processing, storage and merchandising of meat and meat products. Biochemical and physiological implications of nutrition, breeding and antemortem treatment on meat quality, curing and processing.
375. **FUNDAMENTALS OF DAIRY PROCESSING (5). LEC. 3, LAB. 4.** Winter. Physical and chemical characteristics of milk. Milk quality. Basic processing technology.
380. **UNDERGRADUATE SEMINAR (1).** Pr., junior standing. Winter. Lectures and discussions on job opportunities by staff and guests.
392. **PRACTICUM (3).** Fall, Winter, Spring, Summer.
401. **BEEF PRODUCTION (5). LEC. 4, LAB. 2.** The course will be taught assuming students know background information taught in ADS 260, 320, 350 and 361. Fall, Winter, Summer (even years). To provide an overview of the beef cattle industry. To develop modern concepts, ideas and methodology associated with the application of technology to the solution of problems related to reproduction, breeding, nutrition, management and use of facilities in a modern beef cattle industry.
403. **DAIRY CATTLE PRODUCTION (5). LEC. 4, LAB. 2.** The course will be taught assuming students know background information taught in ADS 260, 320, 350 and 361. Spring. Practical application and integration of nutrition, breeding, reproduction, selection, herd health, economics, and management for efficient dairy production.
405. **HORSE PRODUCTION (5). LEC. 4, LAB. 2.** The course will be taught assuming students know background information taught in ADS 260, 320, 350 and 361. Spring. Practical application and integration of nutrition, breeding, reproduction, selection, herd health, economics and management for efficient horse production.

407. **SWINE PRODUCTION (5). LEC. 4, LAB. 2.** The course will be taught assuming students know background information taught in ADS 260, 320, 350 and 361. Fall, Spring, Summer (odd years). Practical application and integration of nutrition, breeding, reproduction, selection, herd health, economics, and management for efficient swine production.
430. **ADVANCED LIVESTOCK JUDGING (3). LEC. 1, LAB. 4.** Pr., ADS 330, COI. Fall. An advanced course in the principles and techniques of grading and selecting livestock based on visual evaluation.
431. **ADVANCED MEAT JUDGING (3).** Pr., ADS 331. Fall. Practice in evaluation and grading of beef, pork and lamb carcasses and cuts. Development of communication skills for the meat industry and exposure to animal agriculture through training in local meat packing plants and intercollegiate competition.
432. **ANIMAL EVALUATION AND MARKETING (3). LEC. 1, LAB. 4.** Pr., ADS 330. Spring. A comprehensive study of live slaughter animal and carcass evaluation techniques used in marketing cattle, sheep and swine.
490. **SPECIAL PROBLEMS (1-5).** Credit to be arranged. Pr., departmental approval, senior standing. Fall, Winter, Spring, Summer. Not open to graduate students. Students will work under the direction of staff members on specific problems.
495. **INTERNSHIP IN ANIMAL AND DAIRY SCIENCE (5-15).** Pr., COI. Fall, Winter, Spring, Summer.

ADVANCED UNDERGRADUATE AND GRADUATE

518. **BIOCHEMISTRY (5). LEC. 4, LAB. 3.** Pr., CH 208. Fall. Classification, structure, and chemistry of the major chemical constituents of living matter. (Same course as CH 518.)
519. **BIOCHEMISTRY (5). LEC. 4, LAB. 3.** Pr., ADS 518 or equivalent. Winter, Spring. Introduction to metabolism. (Same course as CH 519.)
520. **ADVANCED ANIMAL NUTRITION (5). LEC. 4, LAB. 2.** Pr., ADS 320, CH 207. Spring. Nutrition of farm animals; the integration of animal physiology and nutrient metabolism with applied feeding practices used in animal production; discussion of recent nutritional developments.
560. **PHYSIOLOGY OF GROWTH (3).** Pr., ADS 520 or COI. Fall. Factors influencing growth and body composition; genetic, social environment, climate, growth regulators, metabolic rate and growth rates of muscle and adipose tissue; discussions of scientific journal articles.
565. **PHYSIOLOGY OF LACTATION (3). LEC. 3.** Pr., ADS 220 and ZY 316. Fall. The mammary gland, its structure and functions including uptake of precursors and the synthesis and secretion of milk.
570. **ADVANCED MEAT SCIENCE AND MUSCLE BIOLOGY (5). LEC. 3, LAB. 4.** Pr., ADS 370 or equivalent. Spring. Physiology and biochemistry of muscle and its conversion to meat; mechanism of muscle contraction; muscle microanatomy; antemortem and postmortem factors influencing fresh meat composition and quality.
575. **ADVANCED DAIRY PROCESSING (4). LEC. 3, LAB. 3.** Pr., ADS 375 or COI. Spring. Specialized techniques in the processing of different types of dairy products; automation in the dairy plant; quality assurance program.
577. **FOOD PLANT SANITATION (4). LEC. 3, LAB. 2.** Pr., BY 300 or COI. Winter. Sanitary regulation of food plants. Hazards in the food system and their elimination. Quality assurance.
579. **FOOD MICROBIOLOGY (5). LEC. 3, LAB. 4.** Spring. Relationship of habitat to the occurrence of microorganisms on food; environment affecting the growth of various microorganisms in food; microbiological action in food spoilage and food manufacture; physical, chemical and biological destruction of microorganisms in foods; microbiological examination of foodstuffs; and public health and sanitation microbiology.

GRADUATE

(Graduate Standing Required)

620. **MINERAL METABOLISM (3). LEC. 3.** Pr., ADS 519, ZY 560 or COI. Fall (odd years). The function of minerals in animal metabolism including digestion, absorption, metabolic function, distribution, and excretion.
621. **ENERGY METABOLISM (3).** Pr., ADS 519, 520, ZY 560, or COI. Fall (even years). Energy utilization and heat production by animals as related to cellular biochemistry and physiology; factors affecting the digestion and metabolism of feed energy and its contribution to the total energy needs of animals. Interpretations of classical and current research.
622. **PROTEIN METABOLISM (3).** Pr., ADS 519, ZY 560 or COI. Winter (odd years). Nitrogen metabolism in ruminant and monogastric species. Amino acid utilization by the animal body.
623. **VITAMINS (3).** Pr., ADS 519, ZY 524 or ZY 560 or COI. Winter (even years). Chemistry, nutrition and function of the vitamins in metabolism.
625. **ADVANCED MONOGASTRIC NUTRITION (3). LEC. 3.** Pr., ADS 519 and ZY 560 or COI. Spring. Digestion and absorption, nutrient utilization, requirements, and interrelationships in swine and other monogastric animals.
627. **ADVANCED RUMINANT NUTRITION (5).** Pr., ZY 560 and ADS 519 or COI. Spring. Rumen fermentation and the biochemistry of ruminant metabolism.
641. **PROTEINS (5).** Pr., ADS 519 or equivalent. Spring. Chemical and physical properties of amino acids and proteins, protein structures, and the reaction of protein structure to function. (Same course as CH 641.)
642. **LIPIDS (5).** Pr., ADS 519 or equivalent. Fall. Chemistry of the lipids and their biological significance. (Same course as CH 642.)

643. **ENZYMES (5).** Pr., ADS 519 or equivalent. Winter. The principles of enzyme chemistry including the physical chemical and catalytic properties of enzymes; classification of enzymes; and enzyme formation. (Same course as CH 643.)
644. **TOPICS IN BIOCHEMISTRY (2-6 hrs credit - to be arranged).** Pr., ADS 519 or equivalent and COI. Fall, Winter, Spring. (Same course as CH 644.)
645. **BIOCHEMICAL RESEARCH TECHNIQUES (5).** Pr., ADS 519 or equivalent. Summer. Modern biochemical laboratory techniques
646. **MICROBIAL BIOCHEMISTRY (5).** Pr., CH 519 or equivalent, BI 300 or equivalent. Fall. The anatomy, growth and metabolism of the bacterial cell with emphasis on the biochemical makeup of the cell and the regulation of its activities.
650. **EXPERIMENTAL METHODS (5).** Pr., BY 601. Spring (odd years). Research methods used in the animal sciences for the analysis and interpretation of data. Included are experimental designs, experimental techniques and evaluation of research projects.
651. **POPULATION GENETICS (5).** Pr., ZY 300 or equivalent, BY 601. Fall (odd years). Genetic composition, variation and factors that bring about change in populations.
652. **ADVANCED ANIMAL BREEDING (5).** Pr., ADS 651 and BY 601. Spring (even years). Statistical tools and methodology used in animal breeding theory and research. Criteria of selection, methods of selection, evaluation of breeds and application to the animal industry.
661. **ADVANCED REPRODUCTIVE PHYSIOLOGY (5).** Pr., ADS 361, ZY 524. Spring. Physiology and endocrinology of reproduction.
670. **MUSCLE PHYSIOLOGY AND BIOCHEMISTRY (3).** Pr., ADS 519, 560, 570 or COI. Winter. Biology of muscle growth and metabolism, the post-mortem phenomena associated with the conversion of muscle to meat and evaluation of current literature.
680. **SEMINAR (1).** Pr., Graduate standing. Fall, Winter, Spring. An intensive study of selected topics in some facet of animal sciences.
690. **SPECIAL PROBLEMS (1-5).** Fall, Winter, Spring, Summer. Conference problems, assigned reading, literature searches in one or more of the following major fields: (a) animal biochemistry and nutrition, (b) animal breeding and genetics, (c) dairy products, (d) meats, (e) microbiology and (f) physiology and physiology of reproduction.
699. **RESEARCH AND THESIS.** Credit to be arranged. Fall, Winter, Spring, Summer. Research and thesis may be on technical laboratory problems or on problems directly related to beef and dairy cattle, sheep, swine or laboratory animals.
799. **DOCTORAL RESEARCH AND DISSERTATION.** Credit to be arranged.

Anthropology (ANT)

For listing of courses, see page 337.

Architecture (AR)

Professors Davis, Doerstling, Haire, Millman, McPheeters,
and Snow

Associate Professors Blackwell, Drummond, Head, Faust, Gwin, Harmon,
Hing, Meyer, and Zorr

Assistant Professors Becherer, Cook, Finn, Howedy,
Lundell, Robinson, Stewart, and Van Sickle

Adjunct Associate Professor Latta

Adjunct Assistant Professors McDonald and Rome

Architecture Program (AR)

- 110-111-112. **DESIGN FUNDAMENTALS (5-5-5) LAB. 10-10-10.** Pr., acceptance into AR, ID or LA Curriculum. Architectural drawing and basic rendering and communication techniques. Elemental design concepts employing two and three dimensional experiments and study of historic precedents.
- 201-202-203. **ARCHITECTURAL DESIGN (5-5-5) LEC. 2-2-2, LAB. 10-10-10.** Pr., AR 110, 111 and AR 112. Man and his needs as the primary influence in shaping space, form, and function; approach to a design methodology and understanding of structure.
- 261-262-263. **HISTORY AND THEORY OF ARCHITECTURE (3-3-3).** Pr., 2nd year standing. Must be taken in sequence. The development of architecture from ancient times through contemporary examples. The cultural and social milieu, as well as the technology of each period will be investigated to better understand the basic determinants of architectural form. Composition of architectural space, will be considered. Illustrated lectures, readings, drawings, and reports.
- 301-302-303. **ARCHITECTURAL DESIGN (5-5-5) LAB. 15-15-15.** Pr., AR 203, AR 263, MH 161, PS 205. Analysis and solution of building design problems of moderate complexity; emphasis on environmental considerations and introduction of building systems.

- 320. PHOTOGRAPHY I (3).** Pr.: Open to AR, BSC, ID & LA only. COI. An exploration of the 35MM SLR camera in black and white photography for personal expression and as a tool for design.
- 321. PHOTOGRAPHY II (3).** Pr.: AR 320. COI. Development of individual photographic skills and insights into understanding of surroundings.
- 350. 20TH CENTURY ARCHITECTURE (3).** Pr.: AR 263. Philosophical and theoretical architectural concerns of the twentieth century. Classroom format, readings, lectures, discussions and written reports.
- 360. APPRECIATION OF ARCHITECTURE (3).** General elective. Pr.: 2nd year standing. (Not open to AR, ID, and LA students.) Architectural development with particular attention to American and contemporary examples. Illustrated lectures, reading, essays.
- 370. SPACES FOR LIVING (3).** General elective. Pr.: 3rd year standing. (Not open to AR, ID, and LA students.) Contemporary concepts of design, spatial organization, materials, furnishing, and gardens in relation to all major types of residential architecture. Illustrated lectures, readings, repos.
- 401. ARCHITECTURAL DESIGN (5). LAB. 15.** Pr.: AR 303. Buildings of advanced complexity focusing attention on research, analysis and programming methodology; the building complex and urban design considerations.
- 402. ARCHITECTURAL DESIGN (5). LAB. 15.** Pr.: AR 401, BSC 315, 453. Studio exercises deal primarily with design problems on a community scale and are conceived to facilitate the application of principles and techniques introduced in the prerequisite planning courses.
- 403. ARCHITECTURAL DESIGN (5).** Pr.: AR 402. Buildings of advance complexity focusing attention on research, analysis and programming methodology; the building complex and urban design considerations.
- 435. PRESENTATION TECHNIQUES (3). LAB. 6.** Pr.: 2nd year standing. Experience with graphic presentation of architectural subjects in various media with the objective of improving ability for more effective communication of design.
- 451. SEMINARS IN METHODS AND PROCESS (3).** Explorations of the tools and techniques available to the design professional. Complete descriptions of specific seminars available from the department.
- 452. SEMINARS IN CONTEMPORARY ISSUES (3).** Investigation of significant topics and issues that present opportunities and constraints to architectural thought and practice. Complete descriptions of specific seminars available from the department.
- 453. SEMINARS IN INTERDISCIPLINARY STUDIES (3).** Various disciplines that impinge upon the design of buildings, including natural and social sciences, technology, and humanistic studies. Complete descriptions of specific seminars available from the department.
- 456. SEMINARS IN HISTORICAL PERSPECTIVES (3).** Theories, schools, or periods with the intent of expanding awareness of critical attitudes toward both the potentials and limitations of architecture. Focus of individual seminars will range from ancient to post-modern architecture. Complete descriptions of specific seminars available from the department.
- 457. SEMINARS IN ASPECTS OF DESIGN (3).** Detailed aspects of architectural design, such as form, space, style, meaning, imagery, or cultural context, with the intent of developing theoretical and analytical habits of thought. Complete descriptions of specific seminars available from the department.
- 458. SEMINARS IN DISCIPLINES OF ENVIRONMENTAL DESIGN (3).** Related design fields to broaden appreciation of the range of concerns of the design professional. Complete descriptions of specific seminars available from the department.
- 465-466. ARCHITECTURAL DESIGN (8-8). LAB. 16-16.** Pr.: AR 403. Advanced problem solving processes and synthesis of previous design experiences; consideration of total scope of professional concerns, from architectural detailing to community design.
- 467. ARCHITECTURAL DESIGN (8). LAB. 16.** Pr.: AR 466, 499. The extensive development of an architectural problem of the student's choice, under direction of the Committee on Design. Drawings, models, details, and written explanations, oral and/or published presentation for jury consideration.
- 469. LIGHTING (3). LECTURE 1, LAB. 2.** Pr.: 3rd year standing. An introduction to lighting, principles and techniques as applied to design in architecture and interior design.
- 471-472. PROFESSIONAL PRACTICE (3-3).** Pr.: 5th year standing. Procedure in architectural practice; construction methods, estimation of quantities and costs. Office organization, legal requirements; professional organizations and relations; civic responsibility, professional ethics.
- 474. INTRODUCTION TO URBAN PLANNING (3).** Pr.: 4th year standing, AR 263. A survey of urban planning history and theory; an examination of the basic forces, influences and practices shaping urban growth and development.
- 475. URBAN DESIGN (3).** Pr.: AR 474. Case studies seminar illustrating the building processes that shape cities and urbanize regions and the role of architectural and related design professions within these processes.
- 481. COMPUTERS IN ARCHITECTURE (3).** Pr.: 3rd year standing. Survey of existing and emerging techniques of computer utilization in architectural design, production, and management.
- 485. ARCHITECTURAL MANAGEMENT I (5).** Pr.: 5th year standing, Coreq.: AR 471, MN 241. Philosophies, issues, methods and procedures involved in the planning of architectural business operations, marketing of architectural services, management of architectural design processes. Lectures, case studies, research, problems.

486. **ARCHITECTURAL MANAGEMENT II (5).** Pr., AR 485. Coreq., MN 242. Continuation of AR 485. Philosophies, issues, methods and procedures involved in the management of architectural personnel, financial management of architectural operations, initiation of an independent architectural practice. Lectures, case studies, research, problems.
487. **ARCHITECTURAL MANAGEMENT THESIS (8).** Pr., AR 486. Special study of one or more topics, issues and/or problems significant to the management of modern architectural firms. Subject will be at the choice of the candidate and as approved by the Faculty Committee. Candidate must make documentary and oral presentations to staff and guest specialists and will also be expected to defend project.
495. **SPECIAL PROBLEMS. CREDIT TO BE ARRANGED UP TO 5 HRS.** Pr., 3rd year standing. Development of an area of special interest through independent study. May be a group or team effort under direction of the faculty and with prior approval of the head of the Department. Evaluation of the work may be by faculty jury. May be taken more than one quarter. Maximum credit of 15 hours.
499. **DESIGN RESEARCH (2).** Pr., AR 465. The selection and comprehensive programming of a terminal problem in architecture to be executed in AR 467.

Interior Design (ID)

Courses specifically required in the Interior Design curriculum

215. **ELEMENTS OF INTERIOR DESIGN (3).** LEC. 3. Pr., AR 112. The profession of interior design including basic theory of interior design principles, aesthetics, and design concepts. Lectures, reading and discussions.
216. **ELEMENTS OF INTERIOR DESIGN (3).** LEC. 1. LAB. 3. Graphic drawing of interior spaces and related architectural design solutions. Lab projects involve development of delineation skills and techniques in graphic presentations.
217. **ELEMENTS OF INTERIOR DESIGN (3).** LEC. 1. LAB. 3. Basic drafting techniques and skills in relation to development of architectural working drawings required in the construction of interior spaces and equipment.
- 305-306-307. **INTERIOR DESIGN (5-5-5).** LAB. 15-15-15. Pr., AR 203. Admission upon recommendation of the Committee on Design. Analysis and solution of interiors of moderate complexity, with emphasis on domestic and commercial problems. Research, discussion, drawings, models.
- 365-366. **PERIOD INTERIORS (5-5).** Pr., AR 261, 262, and 263. The development of interior spaces, furniture, fabrics, and accessories from pre-Renaissance to 1900. Illustrated lectures, readings, reports, and field trips.
367. **CONTEMPORARY INTERIORS (5).** LEC. 2. Pr., ID 366. The fundamental aspects of interior design, spatial order and characteristics, furniture and fabric design, from 1900 to date. Illustrated lecture, readings, reports.
- 405-406. **INTERIOR DESIGN (5-5).** LEC. 2-2, LAB. 9-9. Pr., ID 307. Admission upon recommendation of the Committee on Design. Analysis and solution of interiors of advanced complexity, with emphasis on institutional and public problems. Research, discussions, drawings, models.
407. **INTERIOR DESIGN (7).** LEC. 2, LAB. 15. Pr., ID 406. The development of a major design problem under the direction of the Committee on Design. Drawings, models, details; oral presentation for jury consideration.
408. **INTERIOR DESIGN RESEARCH (2).** LEC. 1, LAB. 3. Coreq., ID 406. Selection and comprehensive programming of a terminal interior design problem to be executed in ID 407.
- 441-442. **PROFESSIONAL PRACTICE (3-3).** LEC. 1, LAB. 3. Office procedure and methods for interior designers; the techniques and execution of working drawings for buildings, cabinetry and interior details; specification. Discussions, drawings, inspections, reports.
495. **SPECIAL PROBLEMS. CREDIT TO BE ARRANGED UP TO 5 HRS.** Pr., 3rd year standing. Development of an area of special interest through independent study. May be a group or team effort under direction of the faculty and with prior approval of the department head. Evaluation of the work will be by faculty jury. May be taken more than one quarter. Maximum credit: 15 hours.

Landscape Architecture (LA)

231. **INTRODUCTION TO LANDSCAPE ARCHITECTURE (3).** Pr., 2nd year standing. A survey of the art and practice of landscape architecture; its aims, scope and philosophy.
232. **DEVELOPMENT OF LANDSCAPE ARCHITECTURE I (3).** Pr., 2nd year standing. An historical analysis of man's progress in designing land and outdoor space to meet varying needs in different times and places. Emphasis on religious, economic, cultural, social and political conditions, topography and climate as style determinants. Landscape design from ancient times to the first quarter of the nineteenth century. Lectures and collateral reading.
233. **DEVELOPMENT OF LANDSCAPE ARCHITECTURE II (3).** Pr., 2nd year standing. An historical analysis in continuation of AR 232 but may be taken separately. The impact of technological advance on the design of outdoor space. The shift from private to public works and the development of landscape architecture as an instrument of service in the public welfare. Lectures and collateral reading.
- 321-322-323. **BASIC LANDSCAPE ARCHITECTURAL DESIGN (5-5-5).** LAB. 15-15-15. Pr., AR 203, CE 201, HF 222, HF 223, HF 321. Introduction to the analysis and organization of the basic components of the landscape, including spatial elements of earth, plants and structure; design of simple outdoor spaces as they relate to the natural and cultural environment; introduction to principles of planting composition; coordination with courses in landscape construction.
341. **LANDSCAPE CONSTRUCTION I (5).** LAB. 15. Pr., LA 321. Introduction to landscape construction with emphasis on interpretation of topography, problems in the development of land forms, and construction materials, simple site engineering.

- 342. LANDSCAPE CONSTRUCTION II (5). LAB. 15.** Pr., LA 321, Coreq. LA 323. Advanced landscape construction and site engineering; preparation of working drawings, specifications and estimates. This course will run parallel to and may be combined with LA 322.
- 421-422-423. INTERMEDIATE LANDSCAPE ARCHITECTURAL DESIGN (5-5-5). LAB. 15-15-15.** Pr., LA 322. LA 342. A continuation of third year landscape architectural design concepts and principles with increasingly difficult problems involving the total range of the physical environment.
- 431. ADVANCED PLANT COMPOSITION (5). LAB. 15.** Pr., LA 421. A continuation of planting design incorporated in landscape design courses; emphasis on specific problems in respect to knowledge of plant characteristics and requirements in natural and man-made environments; preparation of planting plans and specifications.
- 446. PROFESSIONAL PRACTICE I (5). LEC. 2, LAB. 9.** Pr., LA 422, Coreq. LA 423. Procedure in landscape architectural practice; preparation of working drawings, specifications, and estimates.
- 447. PROFESSIONAL PRACTICE II (5).** Pr., LA 446. Office organization, legal requirements, professional organizations and relations, civic responsibility, professional ethics.
- 450. DESIGN RESEARCH (2).** Pr., LA 451. Directed studies and research involving the selection and comprehensive programming of a terminal problem in landscape architecture to be undertaken in LA 453.
- 451-452. ADVANCED LANDSCAPE ARCHITECTURAL DESIGN (8-8). LAB. 16-16.** Pr., LA 423. Advanced problem solving processes and synthesis of previous design experiences with application to the environmental problems of today. Consideration of the total scope of professional concerns with emphasis on problems at a regional scale and the team approach to design with allied professionals.
- 453. ADVANCED LANDSCAPE ARCHITECTURAL DESIGN (8). LAB. 16.** Pr., LA 450, LA 452. The extensive development of a problem which, by its relative comprehensiveness, will serve as a final examination for the professional degree of Bachelor of Landscape Architecture.
- 455. SEMINAR IN LANDSCAPE ARCHITECTURE (5).** Pr., 5th year standing. A special experimental seminar or independent study course intended to cover topics not treated by regular course offerings.
- 495. SPECIAL PROBLEMS IN LANDSCAPE ARCHITECTURE (3).** Pr., 3rd year standing. Development on a tutorial basis of an area of special interest through independent study. This may be a group or team effort under the direction of the faculty and with prior approval of the Head of the Department. Evaluation of the work shall be by faculty jury. May be taken more than one quarter.

Regional Planning UNDERGRADUATE

- 463. ENVIRONMENTAL DESIGN FOR PLANNERS (2-8).** Pr., COI. An introduction to the design and appreciation of the man-made environment, includes a survey of architectural, landscape architectural and urban design theory and method designed to develop skills in these areas.
- 474. INTRODUCTION TO PLANNING (3).** Pr., COI. A survey of planning history and theory; an examination of the basic forces, influences and practices shaping growth and development. Same as AR 474.

ADVANCED UNDERGRADUATES AND GRADUATES

- 507. RESOURCES AND ENVIRONMENT (5).** An examination of the relationship between man and his physical environment emphasizing his use of natural resources and his impact on the land, sea and atmosphere. Same as GY 507.
- 522. PLANNING AND ENVIRONMENTAL PERCEPTION (3).** Pr., RP 463 and RP 474 or COI. Analysis of human perception of the cultural, social and natural environments; the impacts of landscape alteration and their mitigation.
- 524. PLANNING AND LAND DEVELOPMENT (5).** Pr., RP 474 or COI. Survey and analysis of the economic, legal, administrative, planning and design factors influencing the process of real estate development from the perspectives of developers, planners and consumers.
- 525. SEMINAR IN HISTORIC PRESERVATION PLANNING (3).** Pr., COI. Local, state and national planning for the preservation, restoration, conservation and adaptive reuse of historic buildings and sites within the comprehensive planning process.
- 527. SEMINAR IN CENTRAL BUSINESS DISTRICT REVITALIZATION (3).** Pr., RP 474 or COI. Review and analysis of the goals, principles, strategies and programs for restoring and revitalizing the CBDs of smaller communities with particular emphasis on physical building and reuse activities and their relationships to fiscal, administrative and private sector organization and commitment.
- 529. PLANNING FOR RECREATION AND TOURISM (3).** Pr., COI. Introduction to the basic concepts and methods used in identifying and allocating recreation resources, the development of tourism and the preparation and implementation of tourism and recreation plans and programs.
- 530. COMMUNITY AND REGIONAL ENERGY PLANNING (5).** Pr., COI. Introduction to the national and southeastern needs for the production and conservation of energy resources and the impact of energy development, conservation and use. Special emphasis on the role of energy planning in the comprehensive planning process, with policy formulation for energy planning at the community and regional scale.
- 545. SEMINAR IN RURAL AND COMMUNITY PLANNING (3).** Pr., RP 474 or COI. Consideration of the nature of rural areas and communities, the perspective, responsibility and performance of the planning professional and a critical appraisal of regional and community plans.

- 580. DEVELOPMENT LOCATION ANALYSIS (5).** Pr., COI. Introduction to the location of economic activity and an analysis of site decision-making framework involving several types of developments. Same as GY 560.
- 564. SITE PLANNING (5).** Pr., RP 463, or third year standing in Architecture or Landscape Architecture, COI. An introduction to the art of site planning, an exposition of its principles and application of its techniques with both large and small scale projects.
- 575. SOCIAL WELFARE POLICY (5).** Pr., COI. Current problems, policy issues and proposals in selected social welfare problems are critically examined and evaluated. Same as SW 575.
- 596. SPECIAL PROBLEMS IN PLANNING (1-5).** Pr., RP 474 and COI. Directed study in an area of special interest. Topic and credit to be arranged with advisor and approved by the chairman. May be repeated for a maximum of up to 10 quarter hours credit.

GRADUATE

- 601. HISTORY AND THEORY OF PLANNING (5).** Pr., RP 474 or COI. The historical development of cities and regions. Particular emphasis on the interaction of their dynamic and structural elements. The impact of the planning process and planner on public policy and private decision-making is examined with a survey of the ethics, responsibility and professional practice of planners to assist students to develop a personal philosophy for their work as professionals.
- 602. PLANNING STUDIO I (5).** Pr., RP 601 or COI. An introduction to the solution of a real-world comprehensive planning problem in cooperation with faculty and other professionals, public agencies and jurisdictions. Included will be the survey and analysis of available information, preparation of a study design and work program, review of environmental and technological constraints, investigation of community goals and values and development of draft alternative proposals.
- 603. PLANNING STUDIO II (5).** Pr., RP 602 or COI. A continuation of 602. The preparation of draft land use and housing elements of a comprehensive plan with particular emphasis on their interrelationship with economic development, transportation, public facilities and the local and regional environment.
- 604. PLANNING STUDIO III (5).** Pr., RP 603 or COI. A continuation of 603. The preparation of draft transportation and community facility elements of a comprehensive plan with emphasis on their interrelationships and impacts on community and regional form.
- 605. PLANNING STUDIO IV (5).** Pr., RP 604 or COI. A continuation of 604. The preparation of a comprehensive plan implementation program, including the roles of the executive, legislative and judicial branches of government, grantsmanship and relationships with other governmental agencies and the private sector.
- 610. COMMUNICATION FOR PLANNERS (3).** Cor., RP 601 or COI. Introduction to basic communication skills and equipment and the role of each. Graphics, audio-visuals, models and written communications projects in individual and team efforts.
- 611. TRANSPORTATION PLANNING (3).** Pr., COI. The transportation planning process, trip generation, forecasting and assignment techniques; goal formulation and analysis of plans. Same as CE 611.
- 615. CURRENT PLANNING ISSUES (3).** Pr., RP 601 or COI. Seminar examining topical issues in the fields of urban and regional planning.
- 618. SEMINAR IN COASTAL ZONE PLANNING AND MANAGEMENT (3).** Pr., COI. Seminar in planning for the resolution of multiple use conflicts in the development and conservation of the coastal environment.
- 620. URBAN PLANNING ANALYSIS (5).** Pr., RP 635 or CE 603 or COI. Field application and involvement at the city or neighborhood level; data collection and analysis; agency and program identification; problem definition and recommendation of strategic plan; emphasis on real-world problems with an actual client.
- 621. REGIONAL PLANNING ANALYSIS (5).** Theories of regions and problems of multijurisdictional planning. Analysis of metro-area and regional planning by states. Comprehensive planning by agencies such as TVA, Corps of Engineers and Appalachian Regional Commission. Regional planning and intergovernmental relations. Same as AEC 621.
- 635. PLANNING RESEARCH, ANALYSIS AND FORECASTING (5).** Pr., RP 601 or COI. Introduction to the variety of methods useful in the comprehensive planning process, with special emphasis on small communities and non-metropolitan regions. Emphasis is in survey and analysis, including population projections, migration, economic base, resource allocation, interrelationships between population and facilities/services needs, and the economic impact of development policy decisions.
- 640. PLANNING LAW (5).** Pr., RP 601 or COI. Introduction to the legal base for local government, with special emphasis on the planning for and guiding the development and conservation of land and other resources, including police powers and eminent domain, zoning, subdivision regulations, permit systems and administrative review, health laws and housing and construction codes.
- 642. PLANNING, ADMINISTRATION AND GOVERNMENT (3).** Pr., RP 601 or COI. Policymaking as a public process; planning powers and policy formulation. Identification and selection of goals, development of programs and measuring of performance. Concepts and operations of government and public services and facilities.
- 644. PUBLIC SERVICES AND FISCAL POLICY (5).** Pr., COI. Supply and demand for public services, determinants of public policy programming, public financing, benefit/cost analysis, budgeting and fiscal policy.
- 688. PLANNING SYNTHESIS (5).** Pr., RP 605 and COI following satisfactory completion of oral examination. The demonstration of competence by the production of an original work in planning. This is a terminal project in lieu of thesis and will include the integration of knowledge from previous courses and experience in a proposed solution to a complex regional, rural or community planning problem or project. The emphasis will be on the student's area of specialization and the comprehensive planning process.

Art (AT)

Professors Hiers, Head, Abney, and Williams

Associate Professors Baggett, Hatfield, Hobbs, Olson, Ross, Taugner, and Walls

Assistant Professors Caruthers, Collier, Dugas, Furr, Hanger,

Munday, Price, and Wagoner

Instructors Bogard, and Mitchell

All studio courses require 10 hrs. contact with instructor and 5 hrs. of independent work.

111. **FUNDAMENTALS (5). STUDIO 15.** Mechanical linear perspective.
112. **FUNDAMENTALS (5). STUDIO 15.** Representational drawing. Linear construction, proportion, freehand perspective, chiaroscuro, surface treatments.
113. **FUNDAMENTALS (5). STUDIO 15. Pr., AT 111, 112.** Interpretive drawing. Emphasis on creativity, composition and pictorial organization.
121. **FUNDAMENTALS (5). STUDIO 15.** Plastic elements. Relationship of the arts. Problems in basic design.
122. **FUNDAMENTALS (5). STUDIO 15.** Basic three-dimensional organization. Clay and other media.
123. **FUNDAMENTALS (5). STUDIO 15. Pr., AT 121, 122.** Advanced application of principles encountered in AT 121 and AT 122.
171. **HISTORY OF WORLD ART (3). LEC. 3.** A survey of the major movements and developments of Western art history from Paleolithic art through the Gothic age.
172. **HISTORY OF WORLD ART (3). LEC. 3.** A survey of Western art history from the Renaissance through Realism.
173. **HISTORY OF WORLD ART (3). LEC. 3.** A survey of Western art history, art, and artists from Impressionism through contemporary art.
211. **BASIC FIGURE DRAWING (5). STUDIO 15. Pr., AT 113, 121, 122, 171, 172, 173.** Open to VAT majors only. Drawing in various media emphasizing a subjective approach to the human figure as form and as a compositional element.
212. **FIGURE CONSTRUCTION (5). STUDIO 15. Pr., AT 113, 121, 122, 171, 172, 173.** Open to VAT majors only. Lectures deal with form, function and operation of skeletal and muscular parts of the body. Drawing from casts, models, and skeleton.
213. **FIGURE DRAWING (5). STUDIO 15. Pr., AT 123, 211, 212.** Open to VAT majors only. Drawing from the model in various media, with emphasis on construction, interpretation, and expression.
221. **GRAPHIC PROCESSES (5). STUDIO 15. Pr., AT 111, 112, 123, 171, 172, 173.** Open to VAT majors only. Graphic reproduction processes, preparation of art copy for reproduction, copy fitting, paper, related subjects.
222. **DESIGN SYSTEMS (5). STUDIO 15. Pr., AT 111, 112, 123, 171, 172, 173.** Design procedures for creative problem solving in areas of visual organization; emphasis on presentation and visualization of concepts.
223. **GRAPHIC FORMATS (5). STUDIO 15. Pr., AT 113, 221, 222.** Applied problems in editorial and advertising layout. Emphasis on relationship of format to media.
- 231-331. **OIL PAINTING (5-5). STUDIO 15. Pr., AT 113, 123, 171, 172, 173.**
- 232-332. **TRANSPARENT WATER COLOR (5-5). STUDIO 15. Pr., AT 113, 123, 171, 172, 173.**
- 233-333. **OPAQUE WATER COLOR (5-5). STUDIO 15. Pr., AT 113, 123, 171, 172, 173.**
- 241-341. **RELIEF PRINTMAKING (5-5). STUDIO 15. Pr., AT 113, 123, 171, 172, 173.**
- 242-342. **INTAGLIO PRINTMAKING (5-5). STUDIO 15. Pr., AT 113, 123, 171, 172, 173.**
- 243-343. **PLANOGRAPHIC PRINTMAKING (5-5). STUDIO 15. Pr., AT 113, 123, 171, 172, 173.**
- 251-351. **CLAY SCULPTURE (5-5). STUDIO 15. Pr., AT 113, 123, 171, 172, 173.**
- 252-352. **WOOD SCULPTURE (5-5). STUDIO 15. Pr., AT 113, 123, 171, 172, 173.**
- 253-353. **STONE SCULPTURE (5-5). STUDIO 15. Pr., AT 113, 123, 171, 172, 173.**
301. **ELEMENTARY SCHOOL ART (5). LEC. 3, LAB. 6. Pr., junior standing.** Cannot be taken for credit by VAT majors. An introduction to design principles and elements. The theory of teaching art, methods and materials especially related to elementary school art.
321. **PHOTODESIGN (5). STUDIO 15. Pr., AT 113, 123, 171, 172, 173.** Open to VAT majors only. Technical aspects of equipment, materials and processing. Emphasis on aesthetic analysis. Historical development of photography as related to visual communications. Some special expense required.
322. **PHOTOCOMMUNICATION (5). STUDIO 15. Pr., AT 221, 321.** Photography as applied communication. Emphasis on advanced technical and studio techniques.
323. **TYPOGRAPHICS (5). STUDIO 15. Pr., AT 221.** Practical applications of typography in advertising, editorial, and other contemporary formats. Historical and anatomical development of type and letterforms.

371. **ANCIENT EGYPTIAN AND NEAR EASTERN ART (3). LEC. 3.** Pr., sophomore standing.
372. **ANCIENT GREEK AND ROMAN ART (3). LEC. 3.** Pr., sophomore standing.
373. **MEDIEVAL ART (3). LEC. 3.** Pr., sophomore standing.
374. **GOTHIC ART (3). LEC. 3.** Pr., sophomore standing.
375. **ITALIAN RENAISSANCE ART (3). LEC. 3.** Pr., sophomore standing.
376. **LATE RENAISSANCE AND MANNERIST ART (3). LEC. 3.** Pr., sophomore standing.
377. **BAROQUE AND ROCOCO ART (3). LEC. 3.** Pr., sophomore standing.
378. **EARLY MODERN ART (3). LEC. 3.** Pr., sophomore standing.
379. **LATE MODERN ART (3). LEC. 3.** Pr., sophomore standing.
- 424-425-426. **VISUAL DESIGN I-II-III (5-5-5). STUDIO 15.** Pr., AT 213, 223, junior standing and taken in sequence. Open to VAT majors only. The application of communicative procedures and skills necessary to convey messages by means of graphic presentation; an in depth study of problem solving. Development of student's individual style and main potential.
- 434-435-436. **ADVANCED PAINTING/ DRAWING I-II-III (5-5-5). STUDIO 15.** Pr., AT 213, 231, 232, 233, junior standing and taken in sequence. Open to VAT majors only. Advanced painting with optional media and subject idea. Development of student's individual style and main potential.
- 444-445-446. **ADVANCED PRINTMAKING I-II-III (5-5-5). STUDIO 15.** Pr., AT 213, 241, 242, 243, junior standing and taken in sequence. Open to VAT majors only. Advanced printmaking with optional media and subject idea. Development of student's individual style and main potential.
- 454-455-456. **ADVANCED SCULPTURE I-II-III (5-5-5). STUDIO 15.** Pr., AT 213, 251, 252, 253, junior standing and taken in sequence. Open to VAT majors only. Advanced sculpture with optional media and subject idea. Development of student's individual style and main potential.
- 454-455-456. **ILLUSTRATION I-II-III (5-5-5). STUDIO 15.** Pr., AT 213, 223, junior standing and taken in sequence. Open to VAT majors only. Application of illustrative concepts, media and techniques to various graphic formats. Development of personal skills and an individual style.
471. **THE ARTS OF CHINA (3). LEC. 3.** Pr., sophomore standing. A survey of Chinese art from the Neolithic period through the Ching Dynasty. Special attention is given to the bronze age cultures. Buddhist art, and great landscape painting of the Sung and later periods.
472. **THE ARTS OF JAPAN (3). LEC. 3.** Pr., sophomore standing. A survey of Japanese art and architecture from prehistoric times to the Meiji Restoration, with emphasis on Buddhist influences from China as well as the development of indigenous art forms.
473. **PRE-COLUMBIAN ART (3). LEC. 3.** Pr., sophomore standing. Mesoamerican art of the Pre-Classical, Classical, and Post Classical periods (2000 BC - 1520 AD). Emphasis on Mexico.
499. **TERMINAL PROJECT IN ADVANCED STUDIO (5).** Pr., completion of Group B Studio in area of concentration and a 2.0 cumulative grade point average. A directed terminal studio project with student's choice of subject and medium. The project will be exhibited and a committee will award a letter grade. Professional quality color slides of the project work must be presented to the Art Department before the student is cleared for graduation.

ADVANCED UNDERGRADUATE AND GRADUATE

501. **ART IN EDUCATION (5). LEC. 3., LAB. 6.** Pr., senior standing. Cannot be taken for credit by VAT majors. Lectures, reading and research concerning principles and objectives of pertinent phases of Art for the purpose of understanding their significance in teaching at all levels. Emphasis is placed upon creativity rather than technical skill in laboratory experimentation.
520. **SEMINAR IN ADVANCED DESIGN (5-5)*.** Pr., AT 425, senior standing. Open to students who have shown ability, initiative, and industry on individual projects.
530. **SEMINAR IN ADVANCED PAINTING (5-5)*.** Pr., AT 435, senior standing. Open to students who have shown ability, initiative, and industry on individual projects.
540. **SEMINAR IN ADVANCED PRINTMAKING (5-5)*.** Pr., AT 445, senior standing. Open to students who have shown ability, initiative, and industry on individual projects.
550. **SEMINAR IN ADVANCED SCULPTURE (5-5)*.** Pr., AT 455, senior standing. Open to students who have shown ability, initiative, and industry on individual projects.
560. **SEMINAR IN ADVANCED ILLUSTRATION (5-5)*.** Pr., AT 465, senior standing. Open to students who have shown ability, initiative, and industry on individual projects.
570. **INDEPENDENT STUDY IN ART HISTORY (3-3)†.** Pr., 18 hours of art history, senior standing. Open to students who have shown ability, initiative, and industry on individual projects. Research, drawings and reports on historical topics under supervision.

* (5-5) may be repeated for maximum of 10 hours.

† (3-3) may be repeated for maximum of 6 hours.

GRADUATE

- 631-632-633-634-635-636-637. GRADUATE PAINTING/DRAWING (5-5-5-5-5-5-5). STUDIO 15-15-15-15-15-15.** Open to MFA candidates only. Graduate level painting and/or drawing with student's choice of media and subject ideas. Students are expected to develop a mature personal style of work that exploits their full potential.
- 641-642-643-644-645-646-647. GRADUATE PRINTMAKING (5-5-5-5-5-5-5). STUDIO 15-15-15-15-15-15.** Open to MFA candidates only. Graduate level printmaking with student's choice of media and subject ideas. Students are expected to develop a mature personal style of work that exploits their full potential.
- 651-652-653-654-655-656-657. GRADUATE SCULPTURE (5-5-5-5-5-5-5). STUDIO 15-15-15-15-15-15.** Open to MFA candidates only. Graduate level sculpture with student's choice of media and subject ideas. Students are expected to develop a mature personal style of work that exploits their full potential.
- 671-672-673. GRADUATE ART HISTORY RESEARCH (5-5-5).** Research on approved topics in art history with personal interpretations of the various movements. Consultations and written reports.
- 697. CRITICAL ESSAY (5).** Pr., completion of all studio and art history requirements. The student is expected to give an in-depth critical evaluation of his own works as they relate to theories developed in his research of art history. Conferences with study committee and a formal, written report are required.
- 698. TERMINAL STUDIO PROJECT (5).** Pr., completion of all studio and art history requirements. A major art problem consisting of a sustained single project or a logical sequence of shorter projects. The candidate will be required to conceive and execute a work or works exhibiting pronounced creative ability and technical proficiency. An exhibition of the completed project is required.

Aviation Management (AM)

Professor Williams, Head

Associate Professors Fradenburg and Kiteley

Assistant Professor Callan, Kennedy, and Merritt

Flight Instructors Cash, Farrington, and Glavin

- 200. AEROSPACE PROBLEMS ANALYSIS (5).** Pr., MH 161. Application of basic mathematical and physical concepts to problems in the aerospace industry.
- 201. ELEMENTARY AERONAUTICS (5). LEC. 5.** Basic flight physiology, subsonic and supersonic aerodynamics, aircraft propulsion and structures, and aviation maintenance management.
- 202. AEROSPACE HISTORY (3).** Significant events and accomplishments in man's attempts to move through the air and space. Emphasis is placed on technological developments.
- 214. FLIGHT ORIENTATION (1). LAB 3.** Basic flight experience course for non-pilots to familiarize aviation majors, engineers, teachers and other students desiring a limited exposure to flight. Course includes ground discussion, experience in flight simulator, and aircraft flight time. Special Fee. Course may be repeated up to three times.
- 215-216. PRINCIPLES OF PRIVATE FLIGHT I, II (3-3).** General introduction and preparation for the FAA private pilot written examination. Topics: theory of flight, aircraft and engine performance, regulations, meteorology, and navigation.
- 217-218. PRIVATE PILOT FLIGHT TRAINING I-II (1-1). LAB. 3-3.** For 217 Pr., AM 215. For 218 Pr., AM 216 and 217, or COI. Dual and solo flight instruction and discussion to prepare for FAA Private Pilot Certificate. Special Fee.
- 304. ELEMENTARY METEOROLOGY (5). LEC. 5.** Pr., sophomore standing. Basic principles, causes, effects, and phenomena of weather with fundamental techniques of forecasting.
- 305. AVIATION METEOROLOGY (5). LEC. 5.** Pr., PS 206. Basic meteorology as it applies to the operation of aircraft, with emphasis on observation of weather elements and the interpretation of flight planning weather information.
- 306. WEATHER OBSERVATION (2).** Pr., AM 304 or AM 305. Techniques of weather observations and reporting of basic weather information for aviation. Provides assistance for qualification as a supplementary aviation weather station observer.
- 309. RECIPROCATING ENGINES AND PROPULSION PRINCIPLES (3).** Pr., PS 206 and AE 203. Introduction to basic laws of operation and types of power plants. Detailed coverage of reciprocating engines including principles of operations, major components and important features.
- 310. JET PROPULSION (3).** Pr., AM 309. Review of basic laws as applied to jet propulsion. Detailed study of jet propulsion including principles, components, and major features. Also includes an introduction to propulsion systems used for spacecraft.
- 312. GUIDANCE AND CONTROL FUNDAMENTALS (5). LEC. 5.** Pr., PS 206. Practical air navigation and basic principles of aircraft guidance and control.
- 313. AEROSPACE VEHICLE SYSTEMS (5).** Pr., PS 206. Design, use, and function of typical hydraulic, mechanical, and electrical systems used on aircraft, missiles, and space vehicles.
- 314. AEROSPACE MANAGEMENT AND OPERATIONAL PROBLEMS (3).** Pr., AE 203 or IE 204. Introduction to simulator and inflight use of analog and digital computers; use of digital computers as a management tool in the aerospace industry; case studies and problem assignments.

321. **COMMERCIAL FLIGHT PROBLEMS. (3). LEC. 2, LAB. 3.** Pr., AM 218, or Private Pilot Cert. or COI. Review of principles of flight, aircraft and engine theory and operation, FAA regulations, navigation, meteorology and aircraft performance and operation as applied to commercial flying. Emphasis on preparation for the FAA commercial written examination.
322. **COMMERCIAL FLIGHT TRAINING I (1). LAB. 3.** Coreq., AM 321 and COI. Continuation of flight training toward a Commercial Pilot Certificate with emphasis on the development of precision and accuracy in all intermediate and advanced flight maneuvers. Special Fee.
323. **AIRCRAFT OPERATION AND PERFORMANCE (3). LEC. 2, LAB. 3.** Pr., AM 321 or COI. Principles of aircraft performance and operations, including powerplants, aircraft systems and equipment, and advanced flight maneuvers required for commercial pilots.
324. **COMMERCIAL FLIGHT TRAINING II (1). LAB. 3.** Pr., AM 322, Coreq., AM 323 and COI. Continuation of flight training toward a Commercial Pilot Certificate with emphasis on cross-country, night and instrument flying. Special Fee.
325. **PRINCIPLES OF INSTRUMENT FLIGHT (3). LEC. 2, LAB. 3.** Pr., AM 323 or COI. Instruments, FAA regulations, air traffic control procedures, radio navigation, meteorology, and aircraft operation and performance as applied to instrument flying preparation for the FAA Instrument Pilot Written Examination.
326. **COMMERCIAL FLIGHT TRAINING III (1). LAB. 3.** Pr., AM 324, Coreq., 325 and COI. Continuation of flight training for the Commercial Pilot Certificate with training in transition to complex aircraft. A continuation of instrument and night instruction and a review of all maneuvers for the commercial flight test. Special Fee.
327. **COMMERCIAL FLIGHT TRAINING IV (1). LAB. 3.** Pr., AM 326, Coreq., 325 and COI. Completion of FAA requirements for an unrestricted Commercial Pilot Certificate. Special Fee.
401. **AERONAUTICAL SEMINAR (1).** Pr., senior standing. Special problems and current status of the aerospace industry.
402. **LAND USE CONTROL (2).** Pr., AM 409, Spring. The methods of control of the use of private property with particular emphasis on property near airports.
403. **GENERAL AVIATION MANAGEMENT (3).** Pr., junior standing. An overview of general aviation and its impact and interaction with the total aviation industry including a study of the various users, the suppliers and service organizations, the aircraft and facilities and regulatory framework.
404. **GENERAL AVIATION OPERATIONS (3). LEC. 2, LAB. 3.** Pr., AM 403, Spring. Current principles and practices in commercial aviation operations including organization, sources of revenue, functions, operation and typical problems. Laboratory assignments are provided through the School of Aviation.
405. **AVIATION SAFETY (2). LEC. 2.** Pr., AM 216 or AM 201. Current problems and issues of aviation safety including aircraft accidents, their cause, effect, and the development of safety programs and procedures.
407. **AIR TRANSPORTATION (5).** Pr., AM 202, MT 372. Significance of air transportation and the development of the present system. Economics, and social costs of U.S. air transportation system.
408. **AIR TRANSPORT PLANNING (3).** Pr., AM 409. Management decision making involved in selection of equipment, routes, and the establishment of rates by certificated and non-certificated air carriers.
409. **AEROSPACE LEGISLATION (3).** Pr., AM 407. Development and present status of federal, local and state, and international regulation of aviation using case study methods.
413. **AIRPORT MANAGEMENT (3).** Pr., junior standing. Current practices in management of a civil public airport, including organization, functions, operations, sources of revenue, funding, maintenance and administration.
414. **AIRPORT PLANNING (3).** Pr., AM 413, Spring. Principles and procedures pertaining to planning airport facilities required to meet the immediate and future air transportation of a community or region.
417. **AIRLINE OPERATIONS (5).** Pr., AM 407, senior standing. Airline organizational and managerial practices, the functions and problems of various organizational components.
418. **INTERNATIONAL AIRLINES OPERATIONS (3).** Pr., AM 409, junior standing. Spring. International foreign air carriers, influences of ICAO and IATA, national ownership, determinants of power, operational and management practices, routes and fares.
419. **AIR TRAFFIC CONTROL (5). LEC. 5.** Pr., AM 312. Basic air traffic control procedures, facilities, centers, and operations.
420. **AIR CARGO OPERATIONS (3).** Pr., junior standing. Spring. Domestic and international air cargo operations with emphasis on cargo economics, equipment, domestic and international regulatory activities, agents, operational techniques, systems, and problems.
421. **COMMUTER AIRLINE OPERATIONS AND MANAGEMENT (3).** Pr., AM 409, Coreq. AM 417 or COI. Management practices and operational characteristics of the commuter airline and its place in the air transportation system.
427. **MULTI-ENGINE TRAINING I (2). LEC. 1, LAB. 3.** Pr., AM 327 or Commercial Pilot Certificate and COI. Instruction in the methods and techniques of multi-engine aircraft pilotage. Sufficient ground and flight instruction is given to qualify for the FAA pilot rating of Multi-Engine-Land. Special Fee.
428. **PRINCIPLES OF FLIGHT INSTRUCTION (3).** Pr., AM 327. The principles of teaching as applied to instructing, analyzing, and evaluating flight students with emphasis on preparation for the FAA Flight Instructor's Written Examination.

429. **FLIGHT INSTRUCTOR TRAINING (1). LAB. 3.** Pr., 327 Commercial Pilot Certificate, Coreq. AM 428 and COI. Discussion, instruction, and arranged practice in flight instruction in preparation for the FAA Flight Instructor Certificate. Special Fee.
431. **MULTI-ENGINE FLIGHT TRAINING II (2). LEC. 1, LAB. 3.** Pr., AM 327, 427 and COI. Instrument and night operations to develop flight proficiency in multi-engine aircraft in actual air transportation operation. Includes ten hours experience as co-pilot. May be repeated once. Special fee.
432. **PRINCIPLES OF PROFESSIONAL FLIGHT (3). LEC. 3.** Pr., AM 305, 325. The principles and practices for flight crew qualifications in the areas of aircraft performance, IFR operations, high altitude meteorology, and FAR Parts 121 and 135.
433. **TRANSPORT AIRCRAFT FLIGHT TRAINING (2). LEC. 1, LAB. 3.** Pr., AM 327, 427 and COI. Includes dual instruction in instrument techniques, emergency operation, and performance of multi-engine aircraft. Suitable for preparation for the flightcheck for an Airline Transport Pilot certificate if otherwise qualified. Special Fee.
435. **INSTRUMENT FLIGHT INSTRUCTOR TRAINING (2). LEC. 1, LAB. 3.** Pr., AM 429 and COI. Discussion, instruction, and arranged practice in instrument flight instruction in preparation for the FAA Instrument Instructor Certificate. Special Fee.
437. **MULTI-ENGINE FLIGHT INSTRUCTOR TRAINING (2). LEC. 1, LAB. 3.** Pr., AM 429 and COI. Principles and techniques of multi-engine flight instruction in preparation for FAA Multi-Engine Flight Instructor Rating. Special Fee.
491. **SPECIAL PROBLEMS (VARIABLE CREDIT 1-5).** Pr., department approval. Individual student endeavor under faculty supervision involving special problems of an advanced nature in aviation management. May be taken more than once with a maximum credit of 10 hours.

ADVANCED UNDERGRADUATE AND GRADUATE

551. **AEROSPACE SCIENCE (5).** A non-technical presentation of the principles and fundamentals of aviation and aerospace science, related systems, and related equipment. The course is primarily designed for students who require a general knowledge of aviation or aerospace science. It will include lectures by aerospace authorities and visits to aeronautical and aviation facilities. Not open to engineering students.

Biology (BI)

Coordinator and Professor Mason

For other staff and biology courses, see sections for Botany, Plant Pathology, and Microbiology and Zoology-Entomology.

101. **PRINCIPLES OF BIOLOGY (5). LEC. 4, LAB. 2.** All quarters. Integrated principles of biology, emphasizing structure and function of cells, reproduction, heredity, ecology, and evolution.
102. **PLANT BIOLOGY (5). LEC. 4, LAB. 3.** Pr., BI 101. All quarters. The morphology, physiology, relationships, distribution, and importance of plants.—Credit will not be allowed for both BI 102 and 104.
103. **ANIMAL BIOLOGY (5). LEC. 4, LAB. 3.** Pr., BI 101. All quarters. The morphology, physiology, relationships, distribution, and importance of animals.—Credit will not be allowed for both BI 103 and 104 or ZY 105.
104. **BIOLOGY IN HUMAN AFFAIRS (5). LEC. 5.** Pr., BI 101. All quarters. Application of biological principles to an understanding of man as an organism and as a member of an ecosystem. Credit will not be allowed for both BI 104 and 103 or BI 102 or ZY 105.

Botany, Plant Pathology, and Microbiology (BY)

Professors Lemke, Head, Curl, D. Davis, N. Davis, Diener, Gudauskas, Marshall, Mason, Morgan-Jones, Patterson, Rodriguez-Kabana, and Truelove
Associate Professors Backman, Blevins, Clark, Cody, Freeman, Latham, Peterson, Weete, Williams
Assistant Professors Brown, Campbell, T. Davis, Goslin, V. Kelley, W. Kelley, and Shands
Adjunct Assistant Professor Stout
Instructor Causey
Adjunct Instructor Corsby

With few exceptions Principles of Biology, BI 101, and Plant Biology, BI 102, are prerequisite to all courses in this department. For a description of these and other general biology courses see the section for Biology (above). For additional offerings in microbiology consult the curriculum in Veterinary Medicine (VM), especially with reference to advanced courses in Veterinary Microbiology (VMI).

201. **MICROBES AND MAN (5). Lec. 5.** Fall, Winter, Spring. Survey of microbiology for students interested in facets of microbiology directly affecting human affairs; no previous college chemistry assumed. Basic biology of bacteria, fungi and viruses and their relation to other living systems; special attention given to recognition and control of infectious agents, effective use of vaccines, safe food handling procedures, and other aspects important to human health. This course will not satisfy a curriculum requirement for BY 300 and credit in BY 300 precludes credit in this course.

- 215. INTRODUCTORY BIOLOGICAL STATISTICS (5). LEC. 4, LAB. 2.** Pr., MH 160. Fall, Winter. Elementary statistics as applied to agriculture and biology including an introduction to empirical frequency distributions, descriptive statistics, elementary probability, sampling, estimation, testing hypotheses, linear regression, correlation, and the analysis of variance.
- 216. INTRODUCTORY BIOLOGICAL COMPUTATIONS (3). Lec. 3.** Pr., sophomore level. Winter, Spring. Introductory use of the computer for agricultural and biological computations and data reduction. Introduction to FORTRAN programming and to effective and valid use of available program packages in biology.
- 300. GENERAL MICROBIOLOGY (5). LEC. 3, LAB. 4.** Pr., BI 101, CH 207. All quarters. Fundamentals of microbiology including history of microbiology, cell structure, chemical composition, growth, nutrition, metabolism, genetics, classification, cultivation, and distribution of bacteria, viruses, rickettsia, and fungi; discussion of the effects of chemical and physical agents on the growth of microorganisms. Credit in this course precludes credit for BY 302.
- 302. MEDICAL MICROBIOLOGY (5). LEC. 3, LAB. 4.** Pr., BI 101-102, CH 208. Fall, Spring. Etiology, epidemiology, immunity, identification and pathogenesis of microorganisms of medical importance to man. Credit in this course precludes credit for BY 300. A similar statement is shown for BY 300 above.
- 306. FUNDAMENTALS OF PLANT PHYSIOLOGY (5). LEC. 3, LAB. 4.** Pr., BI 102, CH 203 or 207 or equivalent. Fall, Winter, Spring. General aspects of fundamental life processes of plants involving physiological, structural, and environmental relationships.
- 309. GENERAL PLANT PATHOLOGY (5). LEC. 4, LAB. 2.** Pr., BI 101-102. Fall, Winter, Spring. Nature cause, and control of plant diseases illustrated by studies of the more common diseases of cultivated crops.
- 310. FOREST PATHOLOGY (3). LEC. 1, LAB. 4.** Pr., BI 101-102 or equivalent. Spring. Diseases of forest and ornamental trees from seedling to maturity including cause, identification, prevention, and control; decay in timber and forest products. Field trips emphasize major tree diseases in Alabama.
- 313. SAMPLING I (4). LEC. 3, LAB. 3.** Pr., MH 163. Fall. Basic concepts and procedures of statistical sampling as applied to forest resource assessment and management. Same as FY 313.
- 320. WEED IDENTIFICATION AND ECOLOGY (3). LEC. 2, LAB. 3.** Pr., BI 101-102 or equivalent. Spring. Identification of weeds in vegetative state. Weed distribution and environmental requirements. Field trips will be taken and weed collections will be required.
- 321. FATE OF PESTICIDES IN THE ENVIRONMENT (3). LEC. 2, LAB. 3.** Pr., BI 101-102, CH 207 or equivalent. Spring. Pesticide absorption, translocation by plants and effects on plant processes. Behavior of herbicides in soils and effects on soil microorganisms. Mechanisms of herbicide inactivation and the basis for herbicide selectivity.
- 400. TECHNIQUES IN MICROBIOLOGY (5). LEC. 2, LAB. 6.** Pr., BY 300. Fall. Theory and practice of laboratory techniques essential in microbiology. Laboratory experiments present basic techniques essential for microbiology in general and for specific subdisciplines with emphasis in microbial physiology and virology.
- 403. PESTICIDES (5). LEC. 4, LAB. 3.** Pr., CH 207. Winter. The chemistry, mode of action, activity, formulations, applications, and legal aspects of pesticides and pesticide applications.
- 407. CONCEPTS OF PEST MANAGEMENT (5). LEC. 4, LAB. 3.** Pr., COI. Spring. Pest management technology and philosophy.
- 446. CLINICAL AND PATHOGENIC MICROBIOLOGY (5). LEC. 3, LAB. 4.** Pr., BY 300, junior standing. Fall, Spring. Isolation, cultivation, identification, classification and pathogenesis of infectious agents, including clinical materials: Mycoplasmata (PPL0), Rickettsiae, and Spirochaetes.
- 460. SPECIAL PROBLEMS (1-3).** Pr., COI, senior standing. All Quarters. A. Anatomy; B. Ecology; C. Morphology; D. Pathology; E. Physiology; F. Taxonomy; G. Applied Microbiology; H. Diagnostic Microbiology; I. Microbial Ecology; J. Microbial Physiology; K. Microbial Taxonomy; L. Virology; A student cannot register for more than 3 hours credit in any one quarter or any one area.

ADVANCED UNDERGRADUATE AND GRADUATE

- 501. BIOLOGICAL STATISTICS (5). LEC. 4, LAB. 2.** Pr., MH 161. Fall, Winter, Spring. Basic concepts of experimental statistics, distributions, confidence limits, tests of significance, analysis of variance, linear correlation and regression. For advanced undergraduates and as a beginning course for graduate students in biological sciences.
- 503. BACTERIAL TAXONOMY (5). LEC. 3, LAB. 4.** Pr., BY 300. Winter. International Code of Nomenclature of bacteria. The development of microbiological literacy; classification of taxa based on phylogeny, molecular and numerical concepts.
- 504. INDUSTRIAL MICROBIOLOGY (3). LEC. 3.** Pr., BY 300. Winter. Principles and practices of microbiologists in industry areas surveyed to include manufacture of fermented foods, alcoholic beverages, antibiotics, amino acids, enzymes, and single-cell protein.
- 505. INTRODUCTORY MYCOLOGY (5). LEC. 3, LAB. 4.** Pr., BI 101-102 or equivalent. Fall. A systematic survey of the fungi with emphasis on morphology.
- 506. SYSTEMATIC BOTANY (5). LEC. 3, LAB. 4.** Pr., BI 101-102 or equivalent. Spring, Summer, Fall. Identification, classification, nomenclature, distribution and systematic relationship of the seed-bearing plants, utilizing primarily elements of the local flora as study material. The historical background, literature of plant taxonomy, and rules of nomenclature. Field trips will include an overnight week-end field trip.
- 507. SALT MARSH ECOLOGY (6). LEC. 4, LAB. 12.** Pr., Ten hours of biology including introductory botany. Summer. The botanical aspects of local marshes; includes plant identification, composition, structure, distribution and development of coastal marshes. Offered only at the Gulf Coast Research Laboratory, Ocean Springs, Miss.

- 508. MARINE MICROBIOLOGY (7%). LEC. 5, LAB. 12.** Pr., BY 300 and COI. Summer. Introduces the student to the role of microorganisms in the oceans and estuaries. Special emphasis on bacteria and fungi. Lecture and laboratory work includes sampling procedures, taxonomy of marine bacteria, mineralization, microbial fouling, pollution, and diseases of marine animals. Offered only at the Gulf Coast Research Laboratory, Ocean Springs, Mississippi.
- 509. MARINE BOTANY (6). LEC. 5, LAB. 12.** Pr., Ten hours of biology, including introductory botany, or COI. Summer. Survey, based upon local examples, of the principal groups of marine algae and maritime flowering plants, involving their structure, reproduction, distribution, identification, and ecology. Restricted to participants in the Gulf Coast Research Laboratory Teaching Session.
- 513. GENERAL PLANT ECOLOGY (5). LEC. 3, LAB. 4.** Pr., BY 306. Fall and Spring. Natural vegetation, environment, and interrelationships between the two with primary emphasis on the Southeastern United States. Field trips will be made, including an overnight week-end trip.
- 514. BIOLOGICAL MICROSCOPY (5). LEC. 2, LAB. 6.** Pr., BI 102-103 or equivalent and COI. Fall. Methods of tissue preparation for observation with the light microscope, including fixing, paraffin and plastic embedding, sectioning, general and cyto-chemical staining and mounting. Squash techniques. Optical microscopy, micrometry, and photomicrography. Techniques for developing, printing, enlarging, and copying for photographic illustration. Preparation of 2 x 2 transparencies.
- 515. DEVELOPMENTAL PLANT ANATOMY (5). LEC. 3, LAB. 4.** Pr., BI 101-102 or equivalent. Winter. Comparative anatomy of vascular plants with emphasis on structural and developmental relationships. A review of current anatomical, experimental, and ultra-structural research in plant anatomy.
- 516. MORPHOLOGY OF LAND PLANTS (5). LEC. 3, LAB. 4.** Pr., BI 101-102 or equivalent. Spring. Comparative morphology of the principal groups of land plants with emphasis on structure, development, reproduction, and evolutionary relationships. Living and fossil members of the local flora will be used as study material. Field trips will be made.
- 517. MARINE BOTANY (6). LEC. 8, LAB. 24, 4 days/5 weeks.** Pr., BI 101-102 or equivalent. General survey of marine algae, vascular and non-vascular plants associated with the marine and estuarine environment. Structure, reproduction, identification, distribution, and ecology are considered. Offered only at Dauphin Island Sea Laboratory.
- 518. MARSH ECOLOGY (6). LEC. 8, LAB. 24, 4 days/5 weeks.** Pr., advanced standing in biology. Floral and faunal elements various marine marsh communities. Interaction of physical and biological factors will be emphasized. Structured to provide actual field experience. Trips scheduled to acquaint students with examples of marsh types. Offered only at Dauphin Island Sea Laboratory.
- 521. INDUSTRIAL MICROBIOLOGY LABORATORY (3). LAB. 6.** Pr., BY 504. Spring. Methods for production, detection, purification of microbial products, and one or more projects on fermentations or industrial processes of special interest to the student.
- 530. PLANT NEMATOTOLOGY (5). LEC. 2, LAB. 6.** Pr., BY 309, BI 101 or COI. Winter, even years. Various roles of nematodes in relation to plant diseases caused by the nematodes and other pathogens. Identification of the plant nematodes, nature of pathogenicity, principles and practices of control; recent advances in phytonematology.
- 540. MICROBIAL PHYSIOLOGY AND GENETICS (3). LEC. 3.** Pr., BY 300, CH 203 or 207. Fall. Cellular structure, function, nutritional requirements, energy metabolism, growth cycles, active transport mechanisms, biosynthesis, and mutation and genetics.
- 541. ENVIRONMENTAL MICROBIOLOGY (5). LEC. 3, LAB. 4.** Spring. Pr., BY 300. Theory and application of fundamental principles of microbiology, ecology and biochemistry of microorganisms in the environment.
- 542. GENERAL VIROLOGY (3). LEC. 3.** Pr., BY 300, or equivalent. Spring, Fall. The molecular biology of bacterial, plant, and animal viruses; pathogenesis, diagnosis, and cultivation.
- 543. IMMUNOLOGY (5). LEC. 3, LAB. 4.** Pr., BY 300, COI and junior standing. Spring, Winter. Immunobiology and immunochemistry of humoral and cellular mechanisms of immunity.
- 550. METHODS IN PLANT PATHOLOGY (3). LAB. 6.** Pr., BY 300, 309 or equivalent. Winter. Methods for field assessment of disease damage and sampling disease diagnosis. Preparation of culture media. Procedures for isolation and identification of causal agent, and proof of pathogenicity.
- 551. FOLIAGE HARVEST AND STORAGE DISEASES (3). LEC. 2, LAB. 2.** Pr., 309 or equivalent. Fall. Survey of major diseases of aerial plant parts and fruits. Principles of epidemiology. Harvest diseases and storage problems.
- 552. SOIL-AND SEED-BORNE DISEASES OF PLANTS (4). LEC. 2, LAB. 4.** Pr., BY 309 or equivalent. Spring. Important diseases of seeds, roots, and other subterranean plant parts; including vascular disorders.
- 553. PRINCIPLES OF PLANT DISEASE CONTROL (3). LEC. 2, LAB. 2.** Pr., BY 309. Spring. Control of important plant diseases utilizing the principles of protection and resistance emphasizing chemical control by protectant and systemic fungicides, antibiotics, fumigants, eradication, exclusion, non-target effects, and integrated control systems.

GRADUATE

- 601. BIOLOGICAL STATISTICS II (5). LEC. 4, LAB. 2.** Pr., BY 501 or equivalent. Winter. Analysis of variance, randomized block, Latin square and split plot designs, factorials, analysis of covariance, and multiple regression.
- 602. LEAST SQUARES ANALYSIS OF EXPERIMENTS (5). LEC. 4, LAB. 2.** Pr., BY 501 and 601 or equivalent. Spring, even years. Analysis and interpretation of experimental data by least squares procedures; general linear models and hypotheses; weighted regression; irregular two-factor design.

603. **PLANT MORPHOGENESIS (5). LEC. 3, LAB. 4.** Pr., BY 306 and either BY 515 or 516. Winter. Factors responsible for control and development of form in nonvascular and vascular plants. Laboratory procedures will be largely experimental including techniques for the sterile culture of plant spores, embryos, and excised tissues and organs.
604. **ADVANCED PLANT PHYSIOLOGY I (5). LEC. 3, LAB. 4.** Pr., BY 306 and 10 hours of organic chemistry. Winter. Molecular biology and plant metabolism; a correlation of the fine structures of the cell with metabolic pathways occurring therein.
605. **ADVANCED PLANT PHYSIOLOGY II (5). LEC. 3, LAB. 4.** Pr., BY 604 and COI. Fall. Water relations and mineral nutrition. Internal and external factors affecting the absorption, translocation, utilization, and loss of water and mineral elements by green plants.
606. **ADVANCED PLANT PHYSIOLOGY III (5). LEC. 3, LAB. 4.** Pr., BY 604 and COI. Spring. Plant growth. A review of literature and laboratory methodology of plant physiological subject matter in the areas of plant growth regulators, mode of action of growth regulators, and factors affecting plant growth.
608. **ADVANCED SYSTEMATIC BOTANY (5). LEC. 2, LAB. 6.** Pr., BY 506. Fall. Experimental and research aspects of the taxonomy of vascular plants. The literature, techniques and methodology relative to the identification and biosystematic classification of evolutionary units; intensive study of special groups of plants and the application of resultant data to specific taxonomic problems.
610. **ADVANCED MICROBIAL PHYSIOLOGY (5). LEC. 2, LAB. 6.** Pr., BY 540, CH 518. Spring, odd years. Physiology of microorganisms; energy transfer mechanisms, metabolism, sexuality and mutation.
611. **ADVANCED MICROBIAL GENETICS (5). LEC. 3, LAB. 4.** Pr., BY 540, ZY 300. Spring, even years. Transmission, expression and alteration of genetic information in microorganisms, including the application of methods in microbial genetics to the study of prokaryotes and eukaryotes.
613. **SYSTEMATIC BACTERIOLOGY (5). LEC. 2, LAB. 6.** Pr., BY 503. Summer. Isolation, purification, and identification of bacteria; experimental application of international rules of nomenclature.
616. **CYTOLOGY AND CYTOGENETICS (5). LEC. 3, LAB. 4.** Pr., ZY 300. Winter. Cell structure and function with emphasis on cell reproduction and factors contributing to the evolution of organisms.
617. **PHYTOVIROLOGY (5). LEC. 3, LAB. 4.** Pr., BY 309 or 310, 542. Winter, odd years. To acquaint students with viruses as plant pathogens and the diagnosis and control of diseases caused by them. Laboratory will involve methodology in the transmission, isolation, and characterization of viruses which infect plant.
618. **CLINICAL PLANT PATHOLOGY (5). LEC. AND LAB. 8.** Pr., BY 309 or equivalent or COI. Summer, even years. Identification, epidemiology, etiology, and control of the major diseases on various kinds of economic plants, to be selected on the basis of current needs of the students.
619. **ADVANCED PLANT PATHOLOGY (5). LEC. 3, LAB. 4.** Pr., BY 309 or equivalent. Summer, odd years. Biological significance of etiology, epiphytology, and host-parasite relations in plant diseases. Classical and current theory will be considered in relation to concepts and problems in plant pathology.
623. **ADVANCED MEDICAL MICROBIOLOGY (5). LEC. 2, LAB. 6.** Pr., BY 300 and 542 or equivalent. Winter. Experimental and theoretical aspects of mechanisms of pathogenicity/virulence infectivity, pathologic manifestations, and biochemical activities of microorganisms of medical importance.
625. **SPECIAL PROBLEMS. CREDIT TO BE ARRANGED.** A. Cytology; B. Ecology; C. Morphology; D. Mycology; E. Nematology; F. Pathology; G. Physiology; H. Taxonomy; I. Chemical Weed Control; J. Marine Botany; K. General Biology Teaching & Permission of Instructor; L. Virology; M. Microbial Ecology; N. Experimental Microbiology; O. Clinical Microbiology; P. Medical Virology; Q. Serology; R. Microbial Physiology; S. Microbial Taxonomy; T. Biological Statistics; and U. Statistical Genetics; V. Mycotoxicology; W. Plant Anatomy.
626. **ADVANCED MYCOLOGY I (5). LEC. 2, LAB. 6.** Pr., BY 505 and COI. Spring, even years. Classification of fungi and lichens. Detailed studies of selected families of Ascomycetes and Fungi Imperfecti. Interpretation of comparative morphological criteria and ontogenic patterns as a guide to phylogeny. Intensive floristic investigations of particular habitats.
627. **ADVANCED MYCOLOGY II (5). LEC. 2, LAB. 6.** Pr., 505 and COI. Spring, odd years. Classification of fungi. A detailed survey of the Myxomycetes, Phycomycetes, and Basidiomycetes. Special emphasis will be placed on ecological aspects of fungi in freshwater and forest habitats. Fungal genetics will be studied.
628. **FIELD RESEARCH IN PLANT PATHOLOGY (5). LEC. 2, LAB. 6.** Summer, even years. Field plot design, techniques for applying pesticides, evaluation of disease development, estimation of yield losses, and analysis of data.
640. **DEPARTMENTAL FORUM (1).** Required of all majors, open to all minors. May be taken more than one quarter. Fall, Winter, Spring. Discussions concerning current topics in the various sciences and related fields.
699. **RESEARCH AND THESIS. CREDIT TO BE ARRANGED.** May be taken more than one quarter.
799. **DOCTORAL RESEARCH AND DISSERTATION. CREDIT TO BE ARRANGED.**

Building Science (BSC)

Professor Brandt, Head

Associate Professors Aderholdt, Darden, Fretwell, Shuttleworth, and Timberlake
Assistant Professors Lechner, Mol, Taylor, and Wallace

100. **DRAWING & PROJECTIONS (2). LAB. 6.** Basic architectural drafting techniques.
101. **INTRODUCTION TO BUILDING (4). LEC. 2, LAB. 6.** Pr., BSC 100 or TS 102 or AR 110. Graphic construction communications—working drawings, shop drawings, etc.

- 202. MATERIALS OF CONSTRUCTION (5).** Pr., MH 160. A survey of common building materials.
- 211. MECHANICS OF STRUCTURES (5).** Pr., MH 161, PS 205. Principles of mechanics as applied to building construction; resolution of external forces; analysis of trusses; shear and bending moments.
- 261-262. HISTORY OF BUILDING I-II (3-3).** Pr., sophomore standing. The development and use of construction methods and materials showing the effects on building from ancient to contemporary times. Lectures, readings, reports.
- 304. CONSTRUCTION SYSTEMS (3).** Construction systems for foundations, floors, roofs, and walls.
- 311. STRENGTH OF MATERIALS (5).** Pr., BSC 211. Strength of materials of structural members. Lectures, problems.
- 314. REINFORCED CONCRETE (5).** Pr., BSC 311. Reinforced concrete. Lectures, research and problems.
- 315. APPLIED STRUCTURES (5).** Pr., BSC 314. Applied design of beams and columns in wood and steel.
- 321. CONSTRUCTION ESTIMATING I (5). LEC. 3, LAB. 6.** Pr., junior standing. Detailed estimating of building component quantities.
- 323. FOUNDATIONS & SOILS (3).** Pr., BSC 314. Soil conditions and their effects on building foundations.
- 324. CONSTRUCTION SURVEYING (3). LEC. 2, LAB. 3.** Pr., junior standing. Dimensional controls for buildings.
- 325. FORMWORK DESIGN (3).** Pr., BSC 314. Design of concrete formwork.
- 340. CONSTRUCTION SAFETY (3).** Coreq., BSC 321. Construction safety. Lectures, readings, and reports.
- 351. ENERGY AND BUILDINGS (3).** Pr., junior standing. A survey of the effects of climate, design, materials, and systems on the energy consumption of buildings. Various energy sources (solar, etc.) will be investigated. Lectures, readings, projects.
- 405-406. CONTRACTING BUSINESS I-II (3-3).** Pr., BSC 304 and senior standing. Organizing, managing, and operating the contracting firm.
- 414. ADVANCED STRUCTURES (5).** Pr., BSC 314. Theory and practical design of complex structures, both in steel and reinforced concrete. Lectures, research and problems.
- 431. CONSTRUCTION ESTIMATING II (3).** Pr., BSC 321 and senior standing. Estimating direct and indirect construction costs.
- 434. CONSTRUCTION SCHEDULING (5).** Pr., BSC 321 and senior standing. Management techniques for planning, scheduling, controlling costs, and leveling manpower by use of CPM.
- 452-453. BUILDING AND EQUIPMENT I-II (3-3).** Pr., PS 206. Analysis of heating, air conditioning, water supply, plumbing and electrical systems as related to buildings. Lectures, readings, problems.
- 460. SPECIAL PROBLEMS (CREDIT 1-5).** Pr., department head approval, junior standing. Development of an area of concentration through independent study under staff supervision.
- 490. TERMINAL PROJECT (8). LEC. 2, LAB. 15.** Pr., final quarter prior to graduation. Cost Analysis and Construction Program for a building or special study (each as approved by the Faculty Committee). Construction program to include all documents required by the Contract and/or necessary to construct the project. Candidate will defend project orally before staff and guest specialists.

Chemical Engineering (CHE)

Professor Chambers, Head, Hsu

Associate Professors Guin, Hirth, Lee, Liu, Tarrer, and Vives

Assistant Professors Placek, Ray, and Williams

- 213. DIGITAL COMPUTERS IN CHEMICAL ENGINEERING (3). LEC. 2, LAB. 3.** Workshop on digital computer programming in the area of chemical engineering.
- 310. PROCESS ECONOMICS (3).** Pr., junior standing. The economic factors affecting the design, operations, and economic aspects of industrial chemical processing, including cost estimation and feasibility studies.
- 313. CHEMICAL ENGINEERING ANALYSIS (4).** Pr., MH 265. Departmental approval. Application of mathematical principles and techniques to the analysis and solution of typical chemical engineering problems.
- 320. ANALOG COMPUTATION (3).** Pr., MH 265, PS 222. Departmental approval. The basic principles of analog computer theory and programming applications to chemical engineering. Includes time and amplitude scaling.
- 321. CHEMICAL PROCESS PRINCIPLES (4).** Pr., CH 113, PS 220, Coreq., CHE 331. Application of mass balance and stoichiometry to chemical processes and plants.
- 331. ENGINEERING THERMODYNAMICS (3).** Pr., MH 264, PS 220. Application of thermodynamic laws and principles to engineering.
- 332. CHEMICAL ENGINEERING THERMODYNAMICS I (4).** Pr., CHE 331. Departmental approval. Combined material and energy balances. Applications of second law. Flow processes, energy cycles.

343. **STAGewise PROCESSES (4).** Coreq., CHE 353. Departmental approval. Theory and design methods of stagewise processes such as extraction, leaching and distillation.
352. **FLUID MECHANICS (4).** Pr., CHE 331 or ME 301. Includes conservation equations, momentum transfer in laminar flow, turbulence, dimensional analysis, design calculations for conduits, packed beds, fluidized systems and filtration.
353. **THERMAL TRANSFER (4).** Pr., CHE 352. Departmental approval. Includes heat conduction, heat transfer in laminar flow, turbulent heat transfer, analogy between heat and momentum transfer, boiling and condensing vapor, design calculations on heat transfer equipment and evaporation.
450. **SPECIAL TOPICS IN CHEMICAL ENGINEERING (CREDIT TO BE ARRANGED WITH A MAXIMUM OF 10 HOURS).** Directed reading covering items of chemical engineering theory in depth coupled with individual laboratory work. May be taken more than once.
470. **SEMINAR (1).** SENIOR STANDING. May be taken for credit twice.

ADVANCED UNDERGRADUATE AND GRADUATE

511. **PROCESS DYNAMICS AND CONTROL (4).** LEC. 4. Pr., CHE 313. Junior standing. Departmental approval. Dynamic analysis of chemical processes. Principles of linear feedback control theory, stability, and control system design.
512. **PROCESS DYNAMICS AND CONTROL LABORATORY (1).** LAB. 3. Pr., CHE 511. Experiments demonstrate theory covered in CHE 511.
521. **CHEMICAL ENGINEERING THERMODYNAMICS II (4).** Pr., CHE 332. Departmental approval. Thermodynamics of phase and chemical equilibrium.
522. **CHEMICAL REACTION ENGINEERING (4).** Pr., CHE 521. Departmental approval. Rates of reactions of various orders and complex reactions in respect to the design of chemical reactors. Considered also are catalytic reaction mechanisms and transfer of mass and heat affecting reactor design and operations.
540. **NUCLEAR ENGINEERING (5).** Pr., PS 305 or 320, MH 265 or COI. Atomic physics and nuclear reactions. Nuclear reactor principles, design, and engineering, including radiation, shielding, instrumentation, and heat transfer.
542. **CHEMICAL ENGINEERING DESIGN I (4).** Coreq., CHE 522. Departmental approval. Individual or group design projects relating to chemical engineering practice.
543. **CHEMICAL ENGINEERING DESIGN II (3).** Pr., CHE 542, senior standing. Departmental approval.
551. **MASS TRANSFER (4).** Pr., CHE 353. Laminar and turbulent mass transfer, gas absorption, humidification and distillation.
560. **INTRODUCTION TO PLASTICS (3).** Pr., CH 304 or COI. High polymers. Includes the chemistry, technology and uses of cellulose, phenolics and amino plastics, polyolefins, vinyls, styrene, acrylics, polyesters, epoxies, polyamides, polyurethanes, silicones and rubbers.
565. **INDUSTRIAL WASTE WATER TREATMENT (4).** LEC. 3, LAB. 3. Pr., CHE 352, ME 340, or CE 308. Introduction to chemical treatment methods for industrial waste water pollutants. Identification and analysis of major industrial water pollutants. Design and cost considerations in chemical process treatment equipment.
575. **RATE PROCESSES IN MATERIALS (3).** Pr., CH 408 or COI. Diffusion in the gas, liquid and solid phases and the fundamentals of chemical reaction kinetics pertinent to the crystallization and transformation of materials.
582. **CHEMICAL ENGINEERING LABORATORY (6).** LEC. 3, LAB. 9. Coreq., CHE 551. Departmental approval. Laboratory work in chemical engineering processes.
585. **AIR QUALITY ENGINEERING (4).** LEC. 3, LAB. 3. Pr., CHE 331 or ME 301. Sources and chemical nature of gaseous pollutants. Principles of mass transfer as related to the removal of gas pollutants. Design calculations and engineering of treatment facilities including adsorption and absorption.
595. **BIOCHEMICAL ENGINEERING (3).** Coreq., CHE 522. D. Departmental approval. Kinetics and reactor design for fermentation processes. Principles of industrial sterilization.

GRADUATE

600. **CHEMICAL ENGINEERING ANALYSIS I (3).** Pr., graduate standing. Mathematical analysis of chemical engineering problems to include the formulation of differential equations, analytical and numerical techniques for problem solution; data correlation and analysis, and computer applications.
601. **CHEMICAL ENGINEERING ANALYSIS II (3).** Pr., CHE 600. A continuation of CHE 600.
610. **TRANSPORT PHENOMENA I (3).** Coreq., CHE 600. Principles of momentum, heat and mass transport, laminar systems, equations of motion.
611. **TRANSPORT PHENOMENA II (3).** Pr., CHE 610. A continuation of CHE 610.
612. **TRANSPORT PHENOMENA III (3).** Pr., CHE 611. A continuation of CHE 611 with special emphasis on turbulence.
613. **TRANSPORT PHENOMENA IV (3).** Pr., CHE 612. A continuation of CHE 612.
620. **CHEMICAL ENGINEERING THERMODYNAMICS I (3).** Pr., graduate standing. Properties of real gases and liquids, chemicals and phase equilibrium.

621. **CHEMICAL ENGINEERING THERMODYNAMICS II (3).** Pr., CHE 620. Phase equilibrium of non-electrolytes.
622. **ENGINEERING STATISTICAL THERMODYNAMICS I (3).** Pr., CHE 620. Fundamentals of statistical mechanics, partition functions, chemical equilibrium.
623. **ENGINEERING STATISTICAL THERMODYNAMICS II (3).** Pr., CHE 622. Applications of molecular theory and models to the properties of real gases and liquids.
625. **REACTION ENGINEERING I (3).** Pr., CHE 610. Analysis and design of chemical reactors.
626. **REACTION ENGINEERING II (3).** Pr., CHE 625. A continuation of CHE 625.
630. **PROCESS DYNAMICS AND CONTROL I (3).** Coreq., CHE 600. Advanced linear control system analysis and an introduction to nonlinear systems.
631. **PROCESS DYNAMICS AND CONTROL II (3).** Pr., CHE 630. An introduction to modern control theory with emphasis on chemical reactors and stagewise processes.
632. **PROCESS MODELING AND SIMULATION (3).** Pr., CHE 600. Mathematical modeling of chemical process systems, process simulation with analog computers and digital simulation languages.
633. **OPTIMIZATION (3).** Pr., CHE 632. Applications of linear and non-linear optimization techniques to chemical process and equipment design, introduction to optimal control.
640. **DISTILLATION (3).** Pr., COI, graduate standing. Design principles for multicomponent, extractive, azeotropic, and other complex distillation processes.
641. **ABSORPTION AND EXTRACTION (3).** Pr., COI, graduate standing. Design principles for gas absorption and extraction processes.
642. **HEAT TRANSFER (3).** Pr., COI, graduate standing. Analysis and design principles for advanced heat transfer processes, special emphasis on two phase heat transfer in reaction systems, packed beds, and other process equipment.
645. **POLYMER ENGINEERING (3).** Pr., COI, graduate standing. Structure of polymers, molecular forces and properties, polymer formation and modification, kinetics of polymerization, polymer technology and applications.
646. **PROCESS ECONOMICS (3).** Pr., COI, graduate standing. Venture analysis, project justification, cost estimation, and project engineering.
647. **CHEMICAL-PHYSICAL TREATMENT OF WASTE WATER (3).** Pr., CHE 522, 551. Principles of chemical oxidation, adsorption, ON (3), Pr., COI, graduate standing. flocculation and coagulation, and ion exchange as applied to the treatment of waste water.
650. **SPECIAL TOPICS IN CHEMICAL ENGINEERING (CREDIT TBA).** Pr., COI, departmental approval. May be taken more than one quarter.
670. **SEMINAR (1).** Pr., graduate standing. May be taken up to three quarters for credit.
690. **DIRECTED READING IN CHEMICAL ENGINEERING (CREDIT TO BE ARRANGED).** Pr., departmental approval. May be taken more than one quarter.
699. **RESEARCH AND THESIS. CREDIT TO BE ARRANGED.**
799. **RESEARCH AND DISSERTATION.** Credit to be arranged. May be taken more than one quarter.

Chemistry (CH)

Professors Colburn, Head, Baker, Melius, Shevlin,
Stevens, and Ward

Adjunct Professor McAuliffe

Associate Professors Aull, Dinius, Friedman, Greene, Hargis, Hill, Johnson, Neely
Perry, Peterson, Wheatley, Worley, and Ziegler
Assistant Professors Donnelly, Kohl, Krogh, Livant,
Mathias, Mountcastle, and Webb

Chemistry Laboratory fee per course per quarter is \$20.00. This additional fee which applies to CH 103L, 104L, 105L, 111L, 112L, 113L, 207L, 208L is to be paid at the time the student picks up the locker key at the Scientific Supply Store before the first meeting day of lab. This fee is not refundable after the first ten class days.

101. **INTRODUCTORY CHEMISTRY I (2).** LEC. 3. Pr. or Coreq., MH 140, 160, or 161. To acquaint science students with the classifications of matter and the manner in which the chemist identifies matter and records the nature of its changes. Atomic structure, chemical bonding, molecular aggregations and the laws summarizing the properties and nature of the physical states of matter are considered.
102. **INTRODUCTORY CHEMISTRY II (2).** LEC. 3. Pr., CH 101, Coreq., CH 103L. A continuation of the topics described under CH 101.
103. **FUNDAMENTALS OF CHEMISTRY I (4).** LEC. 4. Pr., high school chemistry, Coreq., MH 160 or 161, CH 103L. Encompasses the subject matter of CH 101 and 102 for the superior student with adequate background preparation. Departmental approval is required for admission to this course.

- 103L. GENERAL CHEMISTRY LABORATORY (1). LAB. 3.** Coreq., CH 102 or 103. The basic laboratory techniques, to experimental measurements, and to the interpretation of data.
- 104. FUNDAMENTALS OF CHEMISTRY II (4). LEC. 4.** Pr., CH 103 or 102. Coreq., CH 104L. A continuation of CH 102 or CH 103. The methods of preparation and the reactions of individual as well as classes of chemical compounds are used to study and illustrate the mechanism and dynamics of chemical change.
- 104L. GENERAL CHEMISTRY LABORATORY (1). LAB. 3.** Pr., CH 103L. Coreq., CH 104. A continuation of CH 103L.
- 105. FUNDAMENTALS OF CHEMISTRY III (4). LEC. 4.** Pr., CH 104. Coreq., CH 105L. Solution chemistry including various ionic equilibria, coordination compounds, acid-base phenomena and redox processes. Quantitative analytical problem-solving will be emphasized.
- 105L. GENERAL CHEMISTRY LABORATORY (1). LAB. 3.** Coreq., CH 105. A continuation of CH 103L and CH 104L.
- 111. GENERAL CHEMISTRY (5). LEC. 4, LAB. 3.** Coreq., MH 160, or 140, or 161. For chemistry majors and others in closely related areas. Credit in CH 101, 102 or 103 precludes credit for this course.
- 112. GENERAL CHEMISTRY (5). LEC. 4, LAB. 3.** Pr., CH 111 or 103. Continuation of CH 111. Credit in CH 104 precludes credit for this course.
- 113. GENERAL CHEMISTRY (5). LEC. 4, LAB. 3.** Pr., CH 112. Continuation of CH 112. Credit in CH 105 precludes credit for this course.
- 201. DESCRIPTIVE CHEMICAL SCIENCE (5). LEC. 5.** Pr., MH 140. To foster in the non-science student an appreciation for the chemical nature of the material universe and the contribution of chemistry to his cultural heritage. This course will not serve as a prerequisite for any other chemistry course.
- 203. ORGANIC CHEMISTRY (5).** Pr., CH 104. Fundamentals of organic chemistry. Designed for students in Home Economics, and others.
- 204. ANALYTICAL CHEMISTRY (3). LEC. 3. EACH QUARTER.** Pr., CH 105 and 105L or 113. Theory and application of gravimetric, volumetric, and colorimetric chemical analysis.
- 204L. ANALYTICAL CHEMISTRY LABORATORY (2). LAB. 8. EACH QUARTER.** Pr. or Coreq., CH 204. Analytical techniques applied to the analysis of ores and minerals.
- 205. ANALYTICAL CHEMISTRY (5). LEC. 3, LAB. 6.** Pr., CH 113 or 204. Fundamental concepts used in analytical chemistry and observed in the laboratory via gravimetric analysis and separation techniques.
- 207. ORGANIC CHEMISTRY (4). LEC. 4.** Pr., CH 104. This course together with CH 208 meets the needs of students in Laboratory Technology, Pre-Medicine, Pre-Dentistry, Pre-Veterinary Medicine, Pre-Pharmacy, and in other biological sciences.
- 207L. ORGANIC CHEMISTRY LABORATORY (1). LAB. 3.** Pr. or Coreq., CH 207.
- 208. ORGANIC CHEMISTRY (3). LEC. 3.** Pr., CH 207 and 207L. Continuation of CH 207.
- 208L. ORGANIC CHEMISTRY LABORATORY (2). LAB. 6.** Pr. or Coreq., CH 208.
- 209. ORGANIC CHEMISTRY (5). LEC. 5.** Pr., CH 208. A continuation of CH 208 with emphasis on those organic compounds considered to be the most important to the understanding of biochemistry; i.e., polyfunctional compounds, carbohydrates, lipids, amino acids, proteins, and heterocyclic compounds.
- 301. BIOCHEMISTRY (5).** Pr., CH 208. Especially designed for students in Pharmacy. Credit in CH 518 precludes credit for this course.
- 302. BIOCHEMISTRY (5).** Pr., CH 301. Continuation of CH 301. Credit in CH 519 precludes credit for this course.
- 303. ORGANIC CHEMISTRY (5). LEC. 4, LAB. 3.** Pr., CH 113. Organic chemistry covering nomenclature, group reactions, important theories and concepts relating to aliphatic and aromatic compounds, designed primarily for chemistry majors.
- 304. ORGANIC CHEMISTRY (5). LEC. 3, LAB. 6.** Pr., CH 303. Continuation and extension of CH 303.
- 305. ORGANIC CHEMISTRY (5). LEC. 3, LAB. 6.** Pr., CH 304. Continuation and extension of CH 303-304, including heterocyclic compounds and many classes of compounds of interest in the field of biochemistry. The laboratory portion of the course will deal primarily with organic qualitative analysis.
- 316. PHYSICAL CHEMISTRY (5).** Pr., MH 140 or 160, CH 105 and PS 205. A one-quarter course for pre-medicine students.
- 490. SPECIAL PROBLEMS IN CHEMISTRY (5). LAB 15.** Pr., COI, senior standing. Not open to graduate students. An individual problem course. Each student will work under the direction of a staff member on some problem of mutual interest. May be repeated for a maximum of 15 credit hours.

ADVANCED UNDERGRADUATE AND GRADUATE

- 504. INTRODUCTION TO MOLECULAR ORBITAL METHODS (5).** Pr., CH 305 and 508 or equivalent. Elementary quantum mechanics, Hückel molecular orbital theory, SCF molecular orbital procedures, orbital symmetry problems, and applications of the various theoretical procedures to organic chemistry.
- 507. PHYSICAL CHEMISTRY (5). LEC. 4, LAB. 3.** Pr., CH 104 or 112; MH 264; PS 221 or 206. A discussion of the more important theories and laws of physical chemistry.
- 508. PHYSICAL CHEMISTRY (5). LEC. 4, LAB. 3.** Pr., CH 507. Continuation of CH 507.

- 509. PHYSICAL CHEMISTRY (5). LEC. 4, LAB. 3.** Pr., CH 508. An extension of principles in CH 507-508 with special reference to modern theories of the structure of matter.
- 510. INTERMEDIATE INORGANIC CHEMISTRY I (5). LEC. 5.** Pr., CH 508. Atomic structures, valence bonding, and periodic properties of the elements.
- 511. INTERMEDIATE INORGANIC CHEMISTRY II (5). LEC. 3, LAB. 6.** Pr., CH 510. Synthesis and purification of typical inorganic compounds.
- 512. CHEMICAL THERMODYNAMICS (5).** Pr., CH 508. Basic laws governing changes in energy in gases, liquids, and solids.
- 513. ANALYTICAL CHEMISTRY (5). LEC. 3, LAB. 6.** Pr., CH 507. Fundamental concepts used in instrumental analytical chemistry and as observed in the laboratory via spectrophotometric, electroanalytical, and chromatographic techniques.
- 515. POLYMER TECHNOLOGY I (4). LEC. 3, LAB. 3.** Pr., CH 304 or CHE 560. Important aspects of polymer science, connection between chemical structure and important properties of modern plastics and synthetic structural materials, the common methods of fabrication of these into articles and the basic chemistry behind their manufacture.
- 516. POLYMER TECHNOLOGY II (3). LEC. 3.** Pr., CH 515 or TE 424. Continuation of CH 515. Study of polymerization and condensation polymers. Modes of fabrication, special use selection requirements, and study of a number of commercially available materials and their areas of use.
- 518. BIOCHEMISTRY (5). LEC. 4, LAB. 3.** Pr., CH 204, 204L, 208. Classification, structure and chemistry of the major chemical constituents of living matter. (Same course as ADS 518.)
- 519. BIOCHEMISTRY (5). LEC. 4, LAB. 3.** Pr., CH 518 or its equivalent. Introduction to metabolism. (Same course as ADS 519.)
- 520. CLINICAL BIOCHEMISTRY (5). LEC. 3, LAB. 6.** Pr., CH 302 or CH 519 or its equivalent. Principles of clinical chemical analysis.

GRADUATE

- 610. ADVANCED INORGANIC CHEMISTRY (5).** Pr., CH 510 or equivalent. Selected groups of inorganic compounds are considered from a modern physicochemical viewpoint; thus emphasizing their chemical and physical properties, their rates of conversion one into another, their molecular structure, and valence relationships.
- 611. PHYSICAL METHODS IN INORGANIC CHEMISTRY (5).** Pr., CH 610 or equivalent. The theory and applications of modern techniques for structural and bonding information in inorganic chemistry. NMR, IR, Raman, NQR, mass spectroscopy, electronic spectra, ESR, and other techniques will be discussed.
- 612. ORGANO-METALLIC CHEMISTRY (5).** Pr., CH 610 or equivalent. General organo-metallic chemistry with an emphasis on recent developments.
- 614. THE CHEMISTRY OF COORDINATION COMPOUNDS (5).** Pr., CH 510 or equivalent. Complex inorganic compounds with emphasis on early and modern developments, isomerism, chelation, and methods of determining formation constants.
- 616. ADVANCED TOPICS IN INORGANIC CHEMISTRY (5).** Pr., CH 610 or equivalent. Includes the most active research areas of modern inorganic chemistry.
- 620. ADVANCED ORGANIC CHEMISTRY I (5). LEC. 5.** Pr., CH 305 or equivalent. Organic reaction mechanisms: free radicals, carbonium ions, carbanions, carbenes, etc.
- 621. ADVANCED ORGANIC CHEMISTRY II (5). LEC. 5.** Pr., CH 620. Physical organic chemistry with emphasis on the interpretation of organic reaction mechanisms.
- 622. ADVANCED ORGANIC CHEMISTRY III (5). LEC. 5.** Pr., CH 620. Current synthetic methods of organic chemistry.
- 623. HETEROCYCLIC COMPOUNDS (5).** Pr., CH 621 or equivalent. Organic compounds containing heterocyclic ring systems.
- 624. ELEMENT-ORGANIC COMPOUNDS (5).** Pr., CH 621 or equivalent. Organic chemistry of Groups III, IV and V elements.
- 625. ORGANIC NITROGEN COMPOUNDS (5).** Pr., CH 621 or equivalent. Organic compounds containing nitrogen.
- 627. SPECIAL TOPICS IN ORGANIC CHEMISTRY (5).** Pr., CH 621 or equivalent. A selection of modern topics in organic chemistry.
- 628. INTRODUCTION TO THEORETICAL ORGANIC CHEMISTRY (5).** Pr., CH 621 or equivalent. Topics generally considered include molecular structure, chemical reactions and energy change; structure-reactivity relationships; dipole moments and carbonium, olefinic and free-radical stability; and organic chemical spectroscopy.
- 630-631. ADVANCED PHYSICAL CHEMISTRY (5-5).** Pr., CH 509. CH 630 is pr. for CH 631. Topics generally considered include kinetic theory of matter, modern theories of the structure of matter, generalized thermodynamics, relation of molecular structure to spectroscopic and thermodynamic properties, and kinetics of chemical reactions.
- 632. RELATION BETWEEN STRUCTURE AND PROPERTIES OF CHEMICAL SUBSTANCES (5).** Pr., CH 631. Established relationships that exist between structures of organic and inorganic compounds and physical properties which are relatively easy to determine. The principal aim is the demonstration of the fundamental relation of structure compounds and electronic configurations.

633. **CHEMICAL KINETICS (5).** Pr., CH 631. The mathematics and characterization of chemically reacting systems includes discussions of the collision theory, the transition state theory, unimolecular reactions in condensed phases, behavior of nonstationary-state systems, and photochemistry.
634. **HETEROGENEOUS EQUILIBRIA (5).** Pr., CH 631. Chemical and physical equilibria in heterogeneous systems.
636. **STATISTICAL THERMODYNAMICS (5).** Pr., CH 631. Statistical approach to thermodynamics and chemical equilibrium.
637. **INTRODUCTION TO QUANTUM CHEMISTRY (5).** Pr., CH 631. Quantum theory as applied to chemical problems.
638. **MOLECULAR SPECTROSCOPY (5).** Pr., CH 631. Theory and application of optical and magnetic resonance spectroscopy.
640. **CARBOHYDRATES (5).** Pr., CH 518 or equivalent. The chemistry of the mono- and polysaccharides.
641. **PROTEINS (5).** Pr., CH 507 and CH 519 or equivalent. Chemical and physical properties of amino acids and proteins, protein structure and the relation of protein structure to function.
642. **LIPIDS (5).** Pr., CH 519 or equivalent. Chemistry of the lipids and their biological significance.
643. **ENZYMES (5).** Pr., CH 519 or equivalent. The principles of enzyme chemistry including the physical, chemical and catalytic properties of enzymes.
644. **TOPICS IN BIOCHEMISTRY (1-10).** Pr., CH 519 or equivalent and COI. Advanced selected areas of metabolism and the techniques for characterization of macromolecules.
645. **BIOCHEMICAL RESEARCH TECHNIQUES (5).** Pr., CH 519 or equivalent. Modern biochemical laboratory techniques.
646. **PHYSICAL BIOCHEMISTRY (5).** Pr., CH 305 and CH 509 or equivalent. The structure and properties of biological compounds (saccharides, lipids, amino acids, proteins, nucleic acids, and enzymes). The bioenergetics of the important metabolic pathways are investigated. Emphasis on structure of biological compounds and mechanisms of biological reactions.
650. **ANALYTICAL CHEMISTRY (5).** Pr., CH 513 or equivalent. Analytical principles, applications and methods, mathematical interpretations, and current developments.
651. **ANALYTICAL CHEMISTRY (5).** LEC. 4, LAB. 3, Pr., CH 513. Analytical application of chemical spectroscopy.
652. **THEORIES AND CURRENT TOPICS OF ANALYTICAL CHEMISTRY (5).** Pr., CH 651. Winter, odd years.
653. **PHYSIO-CHEMICAL SEPARATIONS (5).** LEC. 4, LAB. 3, Pr., CH 509. Spring, even years.
654. **RADIOCHEMICAL ANALYSIS (5).** LEC. 3, LAB. 6, Pr., CH 205. Summer, odd years. The application of radioactive tracers and related techniques to chemical analysis.
655. **CHEMICAL INSTRUMENTATION (5).** LEC. 5. Chemical transducers and conversion of the transducer output to some usable form.
670. **SEMINAR (1).** Each quarter except Summer. Required course for all graduate students in chemistry. May be repeated for a maximum of 10 credit hours.
691. **DIRECTED INDIVIDUAL STUDY IN CONTEMPORARY CHEMISTRY. (CREDIT TO BE ARRANGED.)** Pr., completion of 30 hours of graduate courses in chemistry. May be repeated for credit.

Civil Engineering (CE)

Professors Judkins, Molz, and Rainer

Associate Professors Moore, *Acting Head*, Bell, Benefield, Jenkins, Kurt, Melville,
Morgan, Ramey, Vecellio, and Warman

Assistant Professors Culpepper, Johnson, and Parr,

201. **SURVEYING (5).** LEC. 4, LAB. 3, Pr., CE 202 or concurrently. Data collection and analysis emphasized. Analysis of errors; simple curves, vertical curves, spirals; topographic mapping and land surveying.
202. **INTRODUCTION TO COMPUTER METHODS IN CIVIL ENGINEERING (3).** LEC. 2, LAB. 3, Pr., MH 264 or concurrently. Introduction to electronic digital computer programming; machine solution of civil engineering problems; library programs.
205. **ENGINEERING MECHANICS—STATICS (4).** Pr., PS 220 or concurrently. Coreq., MH 264. Basic principles of statics. Free body concepts. Parallel, concurrent, and nonconcurrent force systems. coplanar and noncoplanar. Friction. Centroids, and moments of inertia.
207. **MECHANICS OF SOLIDS (3).** Pr., CE 205 or ME 205, and MH 264. Coreq., MH 265. Principles of strength of materials; Equilibrium, compatibility, and properties of materials. Mechanics of deformable bodies. Stress-strain-temperature relations. Simple application to stress and deformation analysis of axial force, torsion and flexure problems. Shear and moment at sections.
301. **CIVIL ENGINEERING ANALYSIS (5).** Pr., CE 202, MH 265. Applications of mathematics to analysis of physical systems encountered in civil engineering.

- 304. THEORY OF STRUCTURES I (4).** Pr., CE 207 and MH 265. Objectives of structural design, structural form, introduction to shop drawings, etc.
- 304L. STRUCTURES LABORATORY (1). LAB. 3.** Coreq., CE 304. Laboratory assignments in strain measurement, determination of stress-strain relations, stress-distribution analysis, and experimental behavior of structural components.
- 305. WATER SUPPLY AND DISPOSAL SYSTEMS (5).** Pr., CE 308. Coreq. CE 312. Theory and design of water collection and distribution facilities and waste water collection systems.
- 308. HYDRAULICS (5).** Pr., CE 301, ME 321 or equivalent. Ideal fluid flow, real fluids, fluid resistance; fluid measurement and control; steady pipe flow, steady open channel flow; unsteady flow. Emphasis on steady flow and open channel flow.
- 308L. HYDRAULICS LABORATORY (1). LAB. 3.** Pr., CE 308. Assignments in analysis of experimental data, discharge coefficients of orifices, culverts, weirs, and other control sections, hydraulic and energy grade lines, water surface profiles, pump characteristic curves and unsteady flow.
- 312. HYDROLOGY (4).** Pr., CE 308. Hydrologic cycle, surface and subsurface runoff, meteorology and precipitation, rational formula, unit hydrograph, flood routing, return period, evaporation.
- 320. FUNDAMENTALS OF TRANSPORTATION ENGINEERING (5).** Pr., EC 200, CE 201, junior standing or COI. An introduction to the planning, design and operations of transportation systems.
- 380. THEORY OF STRUCTURES II (5).** Pr., CE 304. Deflections by moment area and virtual work principles and their application to trusses, beams and frames, under axial force, bending, shear and torsion. Analysis of indeterminate structures by method of consistent deformation, moment distribution, and slope deflection.
- 400. ADVANCED SURVEYING AND MAPPING (5). LEC. 4, LAB. 3.** Pr., junior standing. Photogrammetric principles and mensuration are emphasized. Selected topics from map projections, electronic and special instruments; geodesy.
- 404. STRUCTURAL ANALYSIS (4).** Pr., CE 380, 304L. Working stress and ultimate strength theories. Design of structural members in steel, reinforced concrete, and other structural materials. Structural loads. Design criteria and procedures for axial force, bending and shear. Buckling of columns.
- 405. WATER AND WASTE WATER TREATMENT (5). LEC. 4, LAB. 3.** Pr., CE 305, junior standing. Theory, design, and operation of water treatment and waste water disposal facilities considering on a unit operations basis. Laboratory includes fundamental tests relating to both water supply and waste water treatment. Emphasis placed on theory and significance of the tests.
- 406. INTRODUCTION TO SOIL MECHANICS (5). LEC. 4, LAB. 3.** Pr., CE 301, GL 315. Physical properties of soils; subsurface investigations; clay mineralogy; soil classification; concept of effective stress; consolidation theory; time-settlement analyses; soil compaction, and shear strength.
- 408. ENVIRONMENTAL ENGINEERING DESIGN (5).** Pr., CE 405. The theory and design techniques discussed in CE 305 and CE 405 will be applied to the design of environmental engineering systems. The economics of alternative designs will be considered.
- 414. STRUCTURAL STEEL DESIGN (5).** Pr., CE 404. Design and analysis of steel members in tension, compression, shear and flexure, and for combined effects. Elastic and plastic theories. Design of trusses, frameworks, and connections.
- 415. CONSTRUCTION PLANNING (5).** Pr., CE 301, junior standing. The construction process as a system, organization of construction engineering functions; financial analysis; cost concepts and elements in pricing; selection and evaluation of construction methods; CPM and PERT.
- 416. REINFORCED CONCRETE DESIGN (5).** Pr., CE 404. Concrete properties. Design synthesis and analysis of reinforced concrete beams, slabs, columns and footings.
- 417. SOIL AND FOUNDATION ENGINEERING (3).** Pr., CE 304, 406, junior standing. Slope stability; vertical and lateral soil pressures, bearing capacity; foundations.
- 423. SIMILITUDE IN ENGINEERING (3). LEC. 2, LAB. 3.** Pr., COI or senior standing. Principles of dimensional analysis and similitude. Aspects of engineering experimentation. Types and uses of models, analogies. Simple applications to engineering problems.
- 426. RADIOLOGICAL HEALTH ENGINEERING (3).** Pr., senior standing. Sources and properties of radiation, ionizing effects, biological effects, dosimetry, detection and measurement, design of radiation shielding, decontamination, disposal of wastes, legal aspects of radiation control, public attitudes.
- 433. AIRPORT DESIGN (5).** Pr., CE 320, COI, junior standing. An analysis of the elements affecting the design of commercial and general aviation airports including runway configuration, capacity analyses, and geometric design of runways, taxiways and terminal facilities.
- 435. HIGHWAY ENGINEERING (3).** Pr., CE 320, IE 320. Material properties; earthwork operations; highway finance; highway drainage; pavement design.
- 480. CIVIL ENGINEERING MANAGEMENT (5).** Pr., senior standing. The civil engineering manager and his management of engineering personnel, engineering budgets, engineering facilities, engineering design, engineering development and research. Written reports and class presentations of special projects.
- 490. SPECIAL PROBLEMS. (CREDIT 1-5).** Pr., COI and department head approval. Individual student endeavor under staff supervision involving special problems of an advanced nature in civil engineering.

ADVANCED UNDERGRADUATE AND GRADUATE

507. **PUBLIC WORKS ENGINEERING I (3).** Pr., COI. Duties and responsibilities of city engineer, county engineer, and consulting engineer; problems connected with promoting, financing, designing and constructing public works.
509. **ENVIRONMENTAL HEALTH ENGINEERING (3).** Pr., senior standing. Application of engineering methodology to communicable disease control, insect and rodent control, milk and food sanitation, industrial hygiene, refuse collection and disposal, and hazardous waste management.
510. **TRAFFIC ENGINEERING ANALYSIS (5).** Pr., CE 320 and IE 410, or equivalent. Fundamental elements of traffic engineering including traffic and transportation studies, traffic flow theory, and intersection operations.
511. **FLOW IN OPEN CHANNELS (5).** Pr., CE 308. Uniform flow, rapidly varied flow, gradually varied flow, subcritical transitions, surges, supercritical transitions, bends, precipitous slopes, energy dissipation, spillways, and oscillatory waves.
512. **OCEAN ENGINEERING FUNDAMENTALS (4).** Pr., COI, senior standing. Hydrodynamic forces on immersed and semi-immersed structures; marine soil mechanics; forces and motion response of offshore structures; seaworthiness of fixed and floating marine structures; structural material selection and performance criteria.
513. **COASTAL ENGINEERING (4).** Pr., junior standing and CE 308 or equivalent. Basic theories of small and finite amplitude water waves, diffraction, reflection, refraction, wind-generated waves and wave prediction procedures; salinity intrusion; effect of waves on coastal structures.
514. **MECHANICS OF SEDIMENT TRANSPORT (4).** Pr., junior standing and CE 308 or equivalent. Sediment properties, incipient motion, fall velocity, effect of bends and meanders, sediment load, stable channel design, erosion and deposition, movement of sediment by waves.
516. **GROUNDWATER HYDROLOGY (4).** Pr., CE 308, 312, GL 315, junior standing. Aquifers, Darcy's law, well-flow; measurement of hydraulic properties; well construction, infiltration; land subsidence; mathematical modeling of aquifers.
518. **FUNDAMENTALS OF TIMBER AND PRESTRESSED CONCRETE (5).** Pr., CE 416 or COI. Properties of timber and prestressed concrete. Design of timber beams, columns, trusses, and connections. Design of plywood decks and forms, and glue laminated members. Design of pre-tensioned and post-tensioned prestressed concrete beams.
519. **PUBLIC WORKS ENGINEERING II (3).** Pr., senior standing. Engineering management of public works projects; engineering problems of urban transportation, communications, water supply, sewerage, streets, schools, shopping parking, and recreation facilities.
520. **SANITARY ENGINEERING LABORATORY (5).** LEC. 4, LAB. 3. Coreq., CE 405. The physical, chemical, and biological aspects of environmental engineering; laboratory testing procedures and experiments relating to the treatment of waters and wastes; interpretation of routine plant control analyses and indices of pollution.
521. **WATER RESOURCES ENGINEERING (5).** Pr., CE 308, senior standing. Environmental significance; hydrologic factors; water laws; water uses; nature, sources and abatement of pollution; quality control measures; planning.
522. **COMPUTER METHODS IN STRUCTURAL ENGINEERING (3).** Pr., CE 380. Principles of matrix formulations of structural problems; force and displacement methods. Algorithms for computer programs for analysis of trusses, beams and frames. Use of computer programs, practical applications.
524. **AIR POLLUTION (5).** Pr., COI, senior standing. The nature, sources and effects of polluting materials including gases, dusts, vapors and fumes and the relations of atmospheric conditions to their dispersal. Introduction to theory and design of air pollution control devices and sampling programs. Legal aspects of air pollution.
525. **SOIL STABILIZATION (3).** Pr., CE 406, or equivalent; IE 410, junior standing. Methods of stabilizing soft soil; consolidation, compaction with the use of lime, cement and other additives; construction operations, costs, and field control related to soil stabilization.
527. **FUNDAMENTALS OF WATER SUPPLY AND WASTE TREATMENT (5).** Pr., COI, senior standing. (Not for credit for civil engineering students.) The principles of water supply and waste disposal and the chemistry and biology of water and waste treatment will be presented. Alternatives in water supply and waste disposal will be considered and the theory of treatment operations will be discussed. Laboratory exercises will be conducted.
528. **FUNDAMENTALS OF ADVANCED WATER AND WASTEWATER TREATMENT (3).** Pr., CE 405. (Not for graduate credit for civil engineering students.) The principles of various methodologies for advanced water and wastewater treatment will be discussed. Economic trade-offs and process selection will be emphasized.
530. **FOUNDATION DESIGN AND CONSTRUCTION (5).** Pr., CE 417 (or concurrently). Review of reinforced concrete fundamentals; spread footings; combined footings; mat foundations; piles and pile driving; caissons; cofferdams; dewatering; retaining walls; bulkheads.
532. **GEOMETRIC DESIGN (5).** Pr., CE 320. An analysis of the elements affecting the location and design of rural highways, urban highways, and arterial streets including design controls and criteria, cross-section elements, intersection design, interchange design, and social and environmental considerations.
535. **TRAFFIC CONTROL SYSTEMS (5).** Pr., CE 320, junior standing. Fundamentals of traffic control systems including traffic characteristics, control warrants, principles of signal timing, controls for isolated intersections and intersection systems, and route traffic control.
592. **LINEAR OPTIMIZATION METHODS (5).** Pr., MH 265. Simultaneous linear equations and inequalities, vector spaces, transformation of variables, algorithms of solution or optimization of a linear expression with linear constraints, introduction to error analysis, approximation by linear expressions, separable programming, introduction to game theory.

593. **DISCRETE OPTIMIZATION METHODS (5).** Pr., CE 592. Optimization with discrete-valued variables or combination of discrete and continuous variables. Both deterministic and probabilistic situations to be handled by sequential optimization or networks in graph theory. Adaptations of discrete and continuous variable methods, such as finite differences or integer linear programming.

GRADUATE

602. **ADVANCED SOIL MECHANICS (5).** LEC. 4, LAB. 3. Pr., CE 417 or equivalent. Stress-strain characteristics of soils, stress distribution in soil media, consolidation, shear strength, and bearing capacity, with application to analysis and design of spread footings, rafts, and deep foundations; case studies.
603. **QUANTITATIVE METHODS FOR THE PLANNING PROCESS (5).** Statistical and mathematical tools useful in modern planning analysis. Surveys of various techniques to facilitate decisions in the planning process. Emphasis on the role and evaluation of modern quantitative techniques rather than technical competency.
604. **SEEPAGE THROUGH POROUS MEDIA (5).** Pr., CE 417 or equivalent; Darcy's Law, soil permeability coefficients, unconfined and confined flow in porous media; methods of solutions; analog methods; numerical and graphical techniques; soil filters, drainage, dewatering, well flow.
605. **SOIL STABILITY PROBLEMS (5).** Pr., CE 417 or equivalent. Retaining structures including cofferdams, bulkheads, and retaining walls; stability of natural and cut slopes, embankments, earth dam design; methods of field measurements; case studies.
606. **SOIL DYNAMICS (5).** Pr., CE 417 or equivalent. Wave propagations in soils, lumped systems as applied to soil-structure systems, soil properties for dynamic loading conditions; earthquakes, oscillations, and blast loading conditions; analysis and design.
609. **PAVEMENT DESIGN (5).** Pr., CE 435 or equivalent. Utilization of soils for subgrades, bases, and pavements; composition and thickness design for parking, highway, and airport pavements; stress distribution of wheel loads in layered media; construction procedures; field control tests; cost analysis of pavements.
610. **MODEL ANALYSIS OF STRUCTURES (3).** LEC. 2, LAB. 3. Pr., CE 423 or COI. Structural models. Direct and indirect model analysis of structures. Analogies.
611. **TRANSPORTATION PLANNING (3).** Pr., CE 603 or COI. The transportation planning process; trip generation, forecasting and assignment techniques; goal formulation and analysis of plans.
613. **NUMERICAL METHODS IN HYDROLOGY (3).** Pr., CE 202, 301, 308, MH 362 or COI. Development of the basic matter and energy transport equations for the surface and subsurface hydrologic systems, derivation and solution of numerical approximations by direct and iterative methods with applications to engineering problems.
614. **ENVIRONMENTAL DISPERSION PROCESSES (4).** Pr., CE 308, IE 410, or COI. Classical diffusion theories: longitudinal dispersion and transverse and vertical mixing in free surface turbulent shear flow; applications to natural and man-made channels. Special topics include mixing of heated effluents in natural waterbodies, pollutant flushing in estuaries, and the behavior of submerged axisymmetric and two-dimensional jets.
615. **POROUS MEDIA HYDRODYNAMICS (4).** Pr., CE 604, MH 622, or equivalent. Analysis of fluid flow through porous media, potential flow theory and approximate solutions, conformal mapping, confined flow, unconfined flow, well flow, dispersion.
620. **UNIT OPERATIONS IN WATER AND WASTE TREATMENT (4).** Pr., COI. The theory of various unit operations developed and the application of these operations to water and waste treatment is considered.
621. **UNIT PROCESSES IN WATER AND WASTE TREATMENT (5).** Alkalinity, acidity, corrosion, chemical precipitation, ion exchange, adsorption, coagulation, disinfection and gas transfer are discussed. Laboratory exercises relating to each topic are performed.
622. **BIOLOGICAL WASTE TREATMENT (5).** Pr., COI. Development and application of the theories of biological waste treatment.
623. **INDUSTRIAL WASTE TREATMENT (3).** Industrial waste problems, including the characteristics of individual industrial wastes and methods of treatment and disposal.
- 623L. **INDUSTRIAL WASTE TREATMENT LAB. (2).** LAB 6. Laboratory exercises including waste characterization and treatability studies will be conducted.
624. **WATER RESOURCE SYSTEMS I (5).** Pr., CE 593. Applications of systems methodology to the analysis of problems involving hydrology, surface and subsurface reservoirs, flood forecasting, flood routing and reservoir design and operation.
625. **WATER RESOURCE SYSTEMS II (5).** Techniques such as simulation, linear and dynamic programming and queueing theory applied to pipe networks, open channels, transients in closed conduits, and water supply and waste water treatment systems.
626. **WATER RESOURCES SYSTEMS III (5).** Pr., CE 624, 625. Water quality forecasting and multipurpose river basin development. The current literature will be studied.
627. **ENVIRONMENTAL ENGINEERING CHEMICAL THEORY (4).** LEC. 3, LAB. 3. Pr., COI. The chemistry of natural systems including: equilibrium chemistry of dilute aqueous systems, buffer systems in natural water, thermodynamics, and surface chemistry as related to destabilization, stabilization, sorption and ion exchange properties.
628. **STREAM SANITATION (5).** Pr., CE 621 or COI. Physical, chemical, biological and hydrological considerations relating to the degradation and self-purification of streams and estuaries. Water uses and water quality goals, objectives, and criteria. Principles of water quality modeling and waste-load allocation. Field studies will be performed.

629. **ADVANCED WASTE TREATMENT (3).** Pr., COI. Nitrogen and phosphorus removal techniques will be stressed. Other advanced waste treatment topics will be discussed.
630. **ADVANCED STRUCTURAL ANALYSIS (5).** Response of structures to complex loadings and support conditions. Shear center, unsymmetrical bending, curved beams. Beams on elastic foundations. Torsion of non-circular sections. Theories of failure. Inelastic theory of structures. Field line theory of slabs.
631. **SPECIAL TOPICS IN STRUCTURES (3-5).** Topics and credit hours may vary; typical of the topics will be: applied elasticity, shell theory, or fatigue and fracture mechanics.
632. **EXPERIMENTAL TECHNIQUES IN STRUCTURAL ANALYSIS (3).** LEC. 2, LAB. 3. Basic theory, techniques and instrumentation for structural testing. Mechanical and electrical strain gages. Brittle lacquer, photogrid, and photoelastic methods. Instrumentation for structural testing.
634. **ADVANCED THEORY OF STRUCTURES (5).** Moment distribution of frames with multiple degrees of freedom. Minimum energy principle, conjugate structure, elastic center, and column analogy methods. Flexural members with varying moments of inertia. Arches and cables. Special topics.
635. **NUMERICAL TECHNIQUES IN STRUCTURAL ANALYSIS (5).** Numerical methods of analysis for structural members of variable section; stiffness factors; stability, vibrations; elastic foundations, beam-columns.
636. **STABILITY OF STRUCTURES (5).** Geometric instabilities in structures; stability theory, elastic buckling of bars and frames, beam-columns; inelastic buckling; buckling of plates; lateral-torsional buckling of beams; buckling of rings and arches.
637. **ADVANCED MATRIX ANALYSIS OF SKELETAL STRUCTURES (4).** Pr., CE 522 or COI. Review of displacement and force methods of matrix analysis of structures. Advanced applications to determinate and indeterminate trusses, beams and frames. Yielding of supports, lack of fit and temperature effects. Special topics.
638. **FINITE ELEMENT METHODS IN STRUCTURAL MECHANICS (5).** Pr., CE 637 or COI. Principles of finite element analysis. Variational principles, displacement formulations. Plane stress, plane strain and axisymmetric analyses. Extension to three-dimensional problems. Thermal stresses. Special applications.
639. **STRUCTURAL DYNAMICS (5).** Impact and vibratory loadings; impact analyses; undamped and damped single degree of freedom systems; multiple degree of freedom systems; analyses of structures subjected to blast loadings; earthquake analyses.
641. **ANALYSIS OF STRUCTURAL PLATE SYSTEMS (5).** Analysis of isotropic and anisotropic plates with various shapes and boundary conditions due to lateral and inplane loads. Buckling and large deflections considerations in design included. Numerical techniques for solving plate problems.
642. **OFFSHORE STRUCTURAL SYSTEMS (5).** Structural loads produced by hostile environments, steel and concrete offshore structures, dynamic response, fatigue, fracture, laminar tearing; foundations for permanent and semi-permanent offshore installations; seabed-structure interaction.
650. **TRAFFIC FLOW THEORY (5).** Pr., CE 510 or equivalent. Traffic stream characteristics; microscopic and macroscopic traffic models; modeling of intersection operations.
652. **MASS TRANSPORTATION SYSTEMS (3).** Pr., CE 611 or equivalent. Mass transportation technology and characteristics; planning for mass transit; travel demand models; innovative technologies.
654. **TRAFFIC SAFETY ANALYSIS (3).** Pr., CE 510 or equivalent. Elements of traffic safety analysis including data acquisition and management, accident investigation and rate analysis, traffic conflict evaluations and development of countermeasures.
660. **CONSTRUCTION APPLICATIONS OF OPERATIONS RESEARCH I (3).** Pr., CE 592 or equivalent, and MH 560 or equivalent. The application of operations research methods to construction engineering; linear programming; deterministic inventory models; replacement, maintenance, and reliability models. Sensitivity analysis.
661. **CONSTRUCTION ENGINEERING FUNCTIONS (3).** Organization of construction engineering functions emphasizing underlying economic principles and phenomena associated with construction engineering projects. Financial analysis, cost concepts and elements in pricing, volume-cost-profit relationships, decision-making models, and legal environment.
662. **CONSTRUCTION APPLICATION OF OPERATIONS RESEARCH II (3).** Pr., CE 660. The application of operations research methods to construction engineering; dynamic programming; probabilistic inventory models; waiting-lines; simulation.
663. **CONSTRUCTION ENGINEERING METHODS (3).** Pr., CE 660, 661. The application of engineering principles to the selection and evaluation of construction methods.
664. **CONSTRUCTION SYSTEMS PLANNING AND CONTROL (3).** Pr., CE 662, 663. The construction process defined as an engineering system. Applicable methods of describing, analyzing, controlling, and manipulating collections of interrelated construction operations treated as a system; techniques of design of construction sub-systems and appropriate evaluation methods.
665. **CONSTRUCTION ENGINEERING ANALYSIS (3).** Pr., CE 662, 663. Quantitative analysis of material handling systems with emphasis on the measurement and forecasting of productivity in construction engineering.
690. **SEMINAR. CREDIT TO BE ARRANGED.** May be taken more than one quarter.
691. **DIRECTED READING IN CIVIL ENGINEERING. CREDIT TO BE ARRANGED.** May be taken more than one quarter.
699. **RESEARCH AND THESIS. CREDIT TO BE ARRANGED.** May be taken more than one quarter.

Computer Science and Engineering (CES)

Computer Science and Engineering courses are offered by cooperating academic departments; see listing in the School of Engineering, page 150.

Consumer Affairs (CA)

Professor Galbraith

Associate Professors Douty, Hardin, *Head*, Lorendo, Slaten, and Trentham

Assistant Professors Barry, Boles, Cavender, Clem, Duffield, Foster, Potter, Schultz, and Warfield

Instructors Haack and Allen

105. **FUNDAMENTALS OF CLOTHING (5).** LEC. 2, LAB. 8. Pr., CA 115 concurrently or COI. Basic theories and principles of garment selection and structure, including their application in construction of apparel for personal use.
113. **HOUSING FOR MAN (3).** Housing, equipment, and furnishings in terms of the total environment with reference to physical, biological, economic, cultural, and social conditions which affect the family.
115. **CLOTHING AND MAN (3).** Cultural, aesthetic, functional, and technological factors as they interact to determine the meaning and use of clothing and textiles for the individual and society.
116. **ART FOR LIVING I (3).** LEC. 3. A working knowledge of basic concepts in the organization and evaluation of design with emphasis placed upon the contribution of design and color as enrichment of individual and family environment.
- 116L. **ART FOR LIVING LABORATORY (2).** LAB. 4. Pr., CA 116 or concurrently. Provides the opportunity for individuals to explore color and design concepts through the manipulation of materials, tools, and processes and to obtain design evaluation experience.
205. **CLOTHING CONSUMPTION AND SELECTION (3).** Pr., CA 115, CA 116 or equivalent. A survey of the clothing market, consumption problems of consumers, and selection of clothing at all stages of the life cycle.
206. **GARMENT STRUCTURES (5).** LEC. 2, LAB. 6. Pr., CA 105 or COI. Theory and application in shaping fabric to human form; construction problems; use of domestic and commercial equipment.
209. **TAILORING (3).** LAB. 9. Pr., CA 105 or equivalent. Principles of fabric selection and tailoring applied in planning and construction of a suit or coat.
216. **ART FOR LIVING II (3-5).** (3) LEC. 2, LAB. 2. (5) LEC. 2, LAB. 6. Pr., CA 116, 116L or equivalent. A continuation of the individual's artistic environment with emphasis on the application of principles of design and color to specific problems of everyday life.
225. **TEXTILES (5).** Pr., CH 203. Polymers, fibers, yarns, fabrics, and finishes in their relationship to apparel and household textiles.
226. **FASHION SKETCHING (3).** LAB. 6. Pr., CA 116, 116L or equivalent. Provides for the fashion merchandising or clothing design major simple methods of communicating apparel designs through quick sketches to portray fashion in silhouettes, texture, and color.
233. **HOME EQUIPMENT I (5).** LEC. 3, LAB. 4. Home equipment, major and small appliances; emphasis on design, materials and construction, energy requirements, safety standards, operation, and maintenance.
303. **THE HOUSE (5).** LEC. 2, LAB. 6. Analysis, organization, and development of functional residential living spaces, with emphasis on the familial influence.
313. **HOME FURNISHINGS (5).** Pr., CA 116 or equivalent. Construction techniques, materials, and processes of manufacture. Historical overview and study of period styles.
316. **FASHION ANALYSIS (5).** Pr., CA 205. The dynamic nature of fashion and the interacting forces which shape fashion trends in apparel.
323. **MAN THE CONSUMER (3).** Pr., junior standing or COI. All quarters. Management of family resources and consideration of alternatives available to families as consumers. Consumer problems, use of information sources, and analysis of laws protecting consumers.
325. **FASHION MERCHANDISING (5).** Pr., MT 331, 333. Application of principles and practices of merchandising to the retailing of consumer goods and services.
333. **LIGHTING DESIGN (5).** LEC. 3, LAB. 4. Application of functional and aesthetic concepts of lighting design to residential living spaces.
334. **INTRODUCTION TO FIELD EXPERIENCE (2).** Pr., CA 325. Prepares students for maximum utilization of supervised professional field experiences.
335. **FIELD EXPERIENCE IN RETAILING (13).** Pr., CA 325, 334. Three months practical experience, with pay, in large department store. Students are given formal instruction and supervision. Scheduled only by pre-arrangement.
336. **FIELD EXPERIENCE IN CONSUMER AFFAIRS (5-15).** Pr., departmental approval of application. Supervised professional experience. Participating firm or agency selected with faculty approval.

- 342. ANALYTICAL INSTRUMENTATION IN TEXTILES (3).** LEC. 2, LAB. 2. Pr., all Basic Textile courses, TE 241. Use of specialized analytical instrumentation to assist in the production of textile products; as means to solve problems of color mixing, waste water characterization, dust measurement, and the identification of materials. Systems control by instrumentation is also included.
- 343. INTERIOR HOME PROBLEMS (5).** The application of design principles to harmonious combinations of interior furnishings, materials, and finishes.
- 345. CREATIVE CRAFTS (1-2-3).** LAB. 2-4-6. Creative design and execution of a variety of current crafts. Outside research required.
- 355. CONSUMER TEXTILES (3).** LEC. 3. Textile fabrics, finishes, and trade practices with special emphasis on consumer problems. Credit will not be allowed for both CA 225 and CA 355.
- 375. CREATIVE CERAMICS (1-3).** LAB. 9. Working with various clays, building processes, ceramic glazes, and ceramic design.
- 385. CREATIVE WEAVING (3).** Weaving design and experience in selecting yarns, setting up a loom, and weaving one's own fabric.
- 395. CLOTHING DESIGN (5).** LEC. 2, LAB. 6. Pr., CA 206, 226, or COI. Principles of design, structure, and production as they guide designing of apparel within the fashion and cultural context. Designs developed by sketching.
- 398. PROFESSIONAL PLANNING AND DEVELOPMENT (1).** Pr., junior standing or COI. Professional development course designed to assist home economics students in the transition from student to professional.
- 399. EXPERIENTIAL LEARNING (2-5).** Pr., sophomore standing and COI.
- 431. MAN-ENVIRONMENT RELATIONS (2).** Pr., Home Economics core courses or COI. The unifying principles and ideals, which are concerned with man's immediate physical environment (housing, clothing, food) and with his nature as a social being. Analysis and synthesis of principles explored in Home Economics core courses CA 113, 115, 116, NF 112, FCD 157, and CA 323.
- 443. FAMILY RESOURCE MANAGEMENT RESIDENCE (5).** Pr., CA 113, 323, NF 104, 112, FCD 157, junior standing or COI. Experiences in managing a home utilizing various levels of resources. Emphasis is placed on the management process, group relationships, and allocation of scarce resources.
- 465. CERAMICS—ADVANCED CONSTRUCTION AND GLAZING (2-3).** LAB. 9. Pr., CA 375. Advanced construction and glaze techniques emphasizing an individual approach, study of various glazes and glaze properties, mixing and firing of glazes formed from basic chemicals. Independent study under tutorial guidance.
- 466. CERAMICS—WHEEL THROWING (2-3).** LAB. 9. Pr., CA 375. Advanced ceramic techniques emphasizing proficiency in wheel throwing, construction, and glazing. Independent study under tutorial guidance.
- 473. CONTEMPORARY HOME FURNISHINGS (3).** LEC. 2, LAB. 2. Pr., CA 313, 343. Analysis of current developments in the interior home furnishings market; procedures and practices in furnishings merchandising; survey of design concepts of the contemporary interior and its furnishings.
- 478. DISPLAY FUNDAMENTALS (3).** LEC. 2, LAB. 2. Pr., junior standing, CA 116 or equivalent, MT 331 or COI. Exploration of history, equipment, application, and theory of display techniques.
- 490. INDEPENDENT OR FIELD STUDY (1-8).** An individual problems course involving directed readings and/or laboratory or field experiences under the direction of a faculty member on some problem of mutual interest. Field experiences may include work with families, business, or industry.

ADVANCED UNDERGRADUATE AND GRADUATE

- 505. COSTUME DRAPING (5).** LEC. 2, LAB. 9. Pr., 8 quarter hours of clothing construction. Creative experience in development and execution of apparel designs through draping varied fabrics on individualized body structures. Exploration and application of theories, philosophies, and practices of contemporary designers.
- 511. CLOTHING FOR THE HANDICAPPED AND AGED (2).** Pr., junior standing. The physical, psychological and social facets of selecting, adapting, and designing clothing for the aged and handicapped.
- 511L. CLOTHING FOR THE HANDICAPPED AND AGED LABORATORY (2).** LAB (4). Pr., CA 105 or equivalent, junior standing; coreq. CA 511. Concepts learned in CA 511 are applied to laboratory problems.
- 514. SOCIAL PROBLEMS OF HOUSING (5).** Pr., CA 113 or equivalent, or COI. Current housing policies explored as both causes of and solutions to certain social problems. Zoning and exclusionary practices, public housing, cash subsidies for housing examined.
- 515. HISTORY OF TEXTILES (5).** LEC. 5. Pr., AT 171, 172, 173 or HY 101, 102, 103. The development of the textile industry and of fabric design from the earliest times to the present day.
- 516. APPAREL QUALITY ANALYSIS (5).** Pr., CA 105 and 325 or equivalent and junior standing. Analysis of quality variations of soft goods and study of factors affecting quality of materials, manufacturing processes, markets, and resources.
- 521. WORLD APPAREL, TRADE, PRODUCTION, AND DISTRIBUTION (4).** LEC. 4. Pr., MT. 440 or equiv., COI. The large textile and apparel manufacturers who have units outside the U.S. foreign apparel companies who have plants in the U.S., international trade agreements and other factors which influence international trade in textiles and apparel.
- 523. GOVERNMENT AND THE RETAILER (5).** Pr., junior standing, COI. Informative, statistical, and regulatory aspects of governmental departments and agencies affecting textiles and clothing retail operations.
- 524. PLANNED CHANGE IN THE FASHION INDUSTRY (5).** Pr., CA 325 or COI. The process involved in initiating and implementing change in the fashion industry.

- 525. HISTORY OF COSTUME (5). LEC. 5.** Pr., AT 171, 172, 173 or HY 101, 102, 103. Evolution of Western costume from prehistoric time to present day.
- 526. CONSUMER ECONOMICS (5).** Pr., EC 202 and CA 323 or COI. Consumption as an economic activity; theory of consumer choice. The consumer's role in the American economy; impact of various market structures on the consumer; consumer protection; economic issues affecting the consumer.
- 530. CONSUMER/FAMILY ECONOMIC ISSUES AND PUBLIC POLICY (3).** Pr., EC 202 and CA 323 or COI. Investigation of the impact of consumer and family oriented laws and policies on individuals/families. Exploration of individual/family involvement with public policy and legal resources as a means for realizing satisfying lifestyles.
- 533. HOME EQUIPMENT II (5). LEC. 4, LAB. 2.** Pr., PS 200, CA 233. Design, operation, and physical layout of equipment comprising the residential utility core; air treatment, water supply, and distribution; kitchen, laundry, and bath design; energy requirements.
- 535. TEXTILE TESTING (5). LEC. 2, LAB. 6.** Pr., CA 225 or equivalent. Standard testing procedures and equipment used in determining the physical and chemical characteristics of fibers, yarns, and fabrics, and of the statistical methods employed in data evaluation.
- 538. STUDY/TRAVEL IN CONSUMER AFFAIRS (2-8).** Course may be repeated for a maximum of 12 undergraduate credits or 8 graduate credits. Pr., junior standing, COI. Concentrated study in clothing, textiles, housing, interior furnishings or merchandising in U.S. or foreign locations which offer unique resources for investigation in one of these content areas. Lectures presented at pre-arranged points. Papers required on selected phases of the course.
- 541. FAMILY FINANCIAL MANAGEMENT (5).** Pr., CA 323 or COI. Family financial planning, including short-term money management, long-term planning, allocation of family resources, and use of credit.
- 553. THE CONSUMER AND THE MARKET (3).** Pr., MT 331, CA 323. Examination of some factors that determine consumer satisfaction with product performance and value.
- 555. FLAT PATTERN DESIGNING (5). LEC. 2, LAB. 6.** Pr., 8 quarter hrs. clothing construction. Pattern blocking in personal and commercial pattern production. Foundation sloper developed for pattern drafting. Consideration given to figure variations and their effect on styling and production.
- 556. COMPARATIVE METHODS OF APPAREL PRODUCTION (5). LEC. 2, LAB. 6.** Pr., 8 quarter hours of clothing construction. End-use qualities of apparel in relation to options in methods of production and organizational procedures. Implications for consumer decisions and industrial quality control and pricing.
- 560. TEXTILE FINISHES (4).** Pr., CA 225 or equivalent, junior standing. Chemistry and mechanics involved in finishing textile materials. Properties of finished fabrics related to end use.
- 560L. TEXTILE FINISHES LABORATORY (1). LAB. 3.** Coreq. CA 560. Techniques of textile finishing. Analysis and evaluation of finishes.
- 570. ALLOCATION OF FAMILY RESOURCES (3).** Pr., FCD 270, CA 323, 431 or COI. The process of decision-making in families for achieving goals through the effective use of human and material resources. Analysis of case studies and examination of consumer and management problems at all socioeconomic levels.
- 575. CREATIVE TEXTILE DESIGN (5). LAB. 9, OUTSIDE WORK TO BE ARR.** Pr., CA 116, 116L, or AT 121. Introductory techniques used in the creative decoration of fabric, with experience in the execution of these techniques for both fashion and interior textiles.
- 576. ADVANCED PRINTING AND DYEING. A. DISCHARGE AND RESIST PRINTING; B. BLOCK PRINTING; C. SCREEN PRINTING. (3-3-3). LAB. 6.** Pr., CA 575, junior standing. May be repeated for a maximum of 9 credits. Techniques of each type of printing and dyeing studied. Development of designs for hand printing and commercial application. Outside research required.
- 580. PROBLEMS IN DESIGN. A. CLOTHING; B. TEXTILE DESIGN; C. CLOTHING AND TEXTILE DESIGN (3-5). LEC. 1, LAB. 9-12.** Pr., for A, CA 505 and 555; for B and C, foundation courses in the field. COI. Creative work integrating methods, materials, and processes in solution of specified design problems. May be repeated and combined for a maximum of 10 hours.
- 583. SOILING AND DETERGENCY OF TEXTILES (5). LEC. 4, LAB. 2.** Pr., PS 200 or COI. CA 225 or equivalent. Physical and chemical principles involved in textile soil deposition and removal. Effect of soil removal methods on functional properties of textile materials.
- 586. RUG WEAVING (5). LAB. 15.** Pr., CA 385. Various rug weaving techniques, history, development, use in hand weaving and application to commercial production.
- 587. ADVANCED PATTERN WEAVING (5). LAB. 15.** Pr., CA 385. Advanced pattern weaves used in hand weaving and applicable to commercial production.
- 588. EXPERIMENTAL WEAVING (5).** Pr., CA 586, 587. Experimental work with yarns, fibers, and related materials, while initiating and solving individual creative problems using advanced weaving techniques. Allows for student interaction and further preparation of portfolio work.

GRADUATE

- 601. SEMINAR. A. CLOTHING; B. TEXTILES; C. DESIGN; D. HOUSING; E. GENERAL (1-5).** May be taken more than one quarter in residence for a maximum of 10 credits.
- 605. METHODS OF RESEARCH IN HOME ECONOMICS (3).** Pr., BY 501 or EC 274 or 574. Research and investigation methods applicable to the various areas of Home Economics. Required of all graduate students in Home Economics.

609. **SPECIAL PROBLEMS. A. CLOTHING; B. TEXTILES; C. TEXTILE DESIGN; D. HOUSING; E. FAMILY RESOURCE MANAGEMENT; F. CONSUMER AND FAMILY ECONOMICS; AND G. HISTORIC COSTUMES AND/OR TEXTILES (2-5).** Pr., COI. May be repeated and combined for a maximum of 15 hours.
610. **ADVANCED DESIGN STUDIO. A. CLOTHING; B. TEXTILE DESIGN; C. CLOTHING AND TEXTILE DESIGN D. HISTORIC COSTUME AND/OR TEXTILES (3-5). LEC. 1, LAB. 5-9.** Pr., foundation courses in the field. COI. Advanced program for synthesizing study and creative work in student's selected field. May be repeated and combined for a maximum of 15 hours.
630. **RECENT RESEARCH IN CONSUMER AND FAMILY ECONOMICS (4).** Pr., EC 551, CA 634, 636, or COI.
631. **READINGS IN CONSUMER AND FAMILY ECONOMICS (1-4).** Pr., CA 323, CA 541, EC 200 or COI. Independent readings in consumer and family economics.
632. **RESEARCH TECHNIQUES IN HOUSING (5). LEC. 4, LAB. 1.** Pr., statistics and COI. Housing research with particular emphasis on survey methods and data analysis.
633. **FAMILY HOUSING (5). LEC. 5.** Pr., EC 200, SY 201, CA 113 or equivalent. The effects of housing on socio-psychological aspects of the individual and family; economic, legal, and social implications; present trends.
634. **THE FAMILY IN THE AMERICAN ECONOMY (4).** Pr., EC 200, 202; CA 323 or COI. Analysis of the family as an economic unit; standards and levels of living; hazards in the family economy. Examination of the economic effect of government policies and programs on the family.
636. **FAMILY RESOURCE DEVELOPMENT AND ALLOCATION (4).** Pr., EC 551, CA 634 or COI. Economic analysis of conditions, programs, and policies related to development and use of human and non-human resources, with special reference to impact on families and households.
650. **SOMATOMETRY AND GARMENT STRUCTURES (4). LEC. 2, LAB. 5.** Pr., undergraduate courses in clothing and textiles, COI. Theoretical base of problems involved in building garments. Body contour analysis used to plan pattern adjustments. Management of materials, equipment, and processes in garment styling and construction.
652. **CLOTHING AND TEXTILES LITERATURE (5).** A critical examination of the current literature in the fields of clothing and textiles.
653. **ECONOMICS OF CLOTHING AND TEXTILES CONSUMPTION (5).** Pr., EC 200, CA 205 or equivalent. A critical examination of the literature on Clothing and Textiles economics, modern trends in manufacture and distribution, and labor laws and their influence on clothing.
658. **CHEMICAL AND PHYSICAL ANALYSIS OF TEXTILES (5). LEC. 3, LAB. 4.** Pr., CH 207. The theory and application of chemical and physical analytical methods to textiles.
659. **FIBER FORMING POLYMERS (5).** Pr., CH 203 or CH 207. The dependence of fiber properties on the chemical formula, the molecular arrangement, and the morphology of polymers. The influence of chemical and physical treatments on polymers and ultimate fiber properties.
662. **PRACTICUM IN CONSUMER AND FAMILY ECONOMICS (2-8).** May be repeated for a maximum of 8 hours of credit. Pr., departmental approval.
667. **CLOTHING AND BEHAVIOR (5).** Pr., basic courses in Sociology, Psychology, and COI. Clothing as a factor in the physical, social, and psychological environment of man, his response to and use of clothing as an aspect of individual behavior and culture.
669. **PERSONALITY PROJECTION THROUGH CLOTHING (3).** Pr., CA 867, FCD 610 or PG 433 or equivalent. Psychological processes and theories of personality in relation to clothing-oriented behavior, as supported by research. Emphasis is placed on the interrelationships among the self, the body, and clothing at stages of the life cycle.
699. **RESEARCH AND THESIS. CREDIT TO BE ARRANGED.** Required of all students under the Thesis Option in any field.

Counselor Education (CED)

Professors Meadows, Head, Donnan, and Grant
Associate Professors Allen, McEwen, Moracco, and Valine
Assistant Professors Buckhalt, Byrd, Higgins, Hilyer, Pipes and Ragan

Prerequisites and corequisites in the Department of Counselor Education are experience in appropriate fields and employment or professional objectives leading to employment in public school counseling, psychoeducational diagnosis (school psychometry), rehabilitation counseling, mental health counseling, counselor education and college student personnel work. CED 621, CED 622, or equivalent, is a prerequisite or corequisite to advanced study.

321. **LEADERSHIP IN STUDENT DEVELOPMENT (3).** Pr., sophomore standing and COI. For students interested in increasing their understanding and skills in group dynamics and leadership. Particular attention will be paid to application of course content and activities to current co-curricular programs in which students are involved.

- 322. HUMAN RELATIONS TRAINING IN TEACHER EDUCATION (2).** Students are trained in facilitative communication skills which would lead to (1) a deeper understanding of students and the learning process; (2) a more positive working relationship with peers; (3) more efficient methods of classroom management and conflict resolution; and (4) more effective use of support personnel in the school system.
- 422. HUMAN RELATIONS TRAINING FOR THE HEALTH PROFESSIONS (4).** Human relations skills for health care providers; study and practice of the communication process with individuals and in small groups. Limited to students in the health professions.

ADVANCED UNDERGRADUATE AND GRADUATE

- 521. INTRODUCTION TO GUIDANCE AND COUNSELING (5).** Pr., senior standing. Guidance relationships in the classroom. Not open to graduate students majoring in guidance and counseling.
- 522. INTRODUCTION TO COUNSELING THE EXCEPTIONAL INDIVIDUAL (4).** Pr., CED 322. Development of interpersonal relationship skills for persons interested in working with the disabled-physical, mental, social, or mental retardation. Emphasis upon unique aspects of these skills to the handicapped.
- 523. MEDICAL AND ADJUSTMENT ASPECTS OF DISABILITY I (5).** Pr., COI and junior standing. Orientation to medical and adjustment aspects of the disabled individual. Understanding and using medical and paramedical personnel effectively in the rehabilitation process.
- 524. COMMUNITY RESOURCES IN REHABILITATION (3).** The utilization of community resources in furthering the rehabilitation of the disabled individual; the vocational rehabilitation worker as a referral source; and the utilization of those in the community in a coordinated approach to total rehabilitation of the individual.

GRADUATE

(These courses are primarily for graduate students)

- 610. REHABILITATION PROGRAMS, PROFESSIONS AND SERVICES (2).** Pr., COI and graduate standing. History, parameters, career opportunities, and issues in vocational rehabilitation and roles of various professionals. (This course is also offered as RSE 610.)
- 621. PRINCIPLES OF GUIDANCE AND STUDENT PERSONNEL WORK (5).** Enables students to develop a conceptual framework for viewing the inter-relationship of guidance and counseling in terms of (1) personal and social factors and (2) their place in a comprehensive program of student personnel work.
- 622. INTRODUCTION TO REHABILITATION COUNSELING (4).** Pr., graduate standing. Counseling process in the rehabilitation setting including basic helping skills. Focusing on the professional, legal, and ethical responsibilities of the counselor.
- 624. MEDICAL AND ADJUSTMENT ASPECTS OF DISABILITY II (5).** Pr., CED 523. A continuation of CED 523. Focuses on rehabilitation with the chronically disabled.
- 625. INTERNSHIP (5-15).** Supervised, on-the-job experiences in a school, college, or other appropriate setting. These experiences will be accompanied by regularly scheduled, on-campus discussion periods for positive evaluation and analysis of the intern experience.
- 626. CASE MANAGEMENT IN REHABILITATION COUNSELING (5).** Pr., CED 622 or COI. A critical analysis of representative rehabilitation cases, and case records. Attention is focused on process, diagnosis, and provision of services.
- 627. PROBLEMS IN GUIDANCE (5).** Pr., COI. Develops competency in the application of counseling theory and research findings, with special emphasis on educational problems.
- 628. COUNSELING THEORY AND PRACTICE I (5).** LEC. 3, LAB. 4. Pr. or coreq., CED 621 or 622. Presents alternative theoretical strategies of counseling; prepares the student for further study of the theoretical and practical aspects of counseling; and provides field opportunities for practical application of theoretical concepts.
- 629. COUNSELING THEORY AND PRACTICE II (5).** Pr., CED 628. A continuation of CED 628.
- 630. GROUP DYNAMICS IN COUNSELING (5).** Pr., CED 621. Contemporary theories and analysis of concepts, models and pertinent research in group dynamics as it pertains to counseling.
- 631. GROUP PROCEDURES IN COUNSELING (5).** Pr., CED 621, 628. The history, philosophy, and principles of group counseling and guidance. Includes pertinent research, and the dynamics of group interaction in counseling settings.
- 632. ORGANIZATION AND ADMINISTRATION OF GUIDANCE PROGRAMS (5).** Pr. or coreq., CED 621. For administrative and guidance personnel. Topics discussed include principles of administrative practice, role of staff in regard to the guidance program, organizational patterns for guidance programs, possible ways of initiating a guidance program, and means of evaluation.
- 633. ANALYSIS OF THE INDIVIDUAL (5).** Pr. or coreq., CED 621; Pr., PG 515. Emphasizes knowledge, understanding and skill necessary to obtain records and appraise information about the client as an individual and as a member of a group.
- 634. COUNSELING IN THE ELEMENTARY SCHOOL (5).** Pr., CED 621. Counseling and related activities are considered in the scope of pupil personnel activities as a developmental process in the elementary school.
- 635. PLACEMENT SERVICES IN REHABILITATION COUNSELING (3).** Pr., CED 622 or COI. Processes and procedures in placement of the handicapped including job modification, development, and analysis with special attention to the severely handicapped.

636. **VOCATIONAL APPRAISAL (5).** Pr., PG 515 or equivalent and COI. Appraisal of interest, aptitude, and personality tests used in the process of counseling with individuals confronted with vocational decisions. Laboratory practice in test administration, scoring, interpretation, and reporting.
637. **THEORIES OF VOCATIONAL DEVELOPMENT (5).** Pr., CED 621 or COI. Theories of vocational development with special emphasis on the integration and practical application of the theories in counseling.
638. **INFORMATION SERVICES IN GUIDANCE AND COUNSELING (5).** Pr., or coreq., CED 621 or 622. Educational and occupational information services and their relationship to counseling.
640. **PROFESSIONAL ISSUES IN SCHOOL PSYCHOLOGY (4).** Pr., admission to school psychology program, or COI. Professional roles and standards; ethical and legal concerns; current issues affecting professional practice.
641. **CONSULTATION (4).** Pr., CED 628 or COI. Theory, process, and content of consultation for counselors and school psychologists.
646. **DIRECTED INDEPENDENT STUDY (1-6).** The student's learning efforts are guided toward desired objectives. Includes evaluation by professor and student of work accomplished at regular intervals.
647. **SUPERVISORY PROCEDURES IN REHABILITATION COUNSELING (5).** Pr., EDL 620 and COI. Procedures and practices specific to the supervision of rehabilitation counselor and counselor-related services in rehabilitation agencies.
648. **PLANNING AND PROGRAM DEVELOPMENT IN REHABILITATION COUNSELING (5).** COI. Trends in program development, planning, and evaluation of research and theoretical writings in the area. A comprehensive study of research and demonstration projects in rehabilitation counseling.
650. **SEMINAR IN AREA OF SPECIALIZATION (1-5).** Pr., COI. May be repeated for credit not to exceed 10 hours. Provides for advanced graduate students and professors to pursue cooperatively selected concepts and theoretical formulations.
653. **COUNSELING PROGRAMS IN HIGHER EDUCATION (5).** Pr., CED 621. Integration of counseling functions within the total student personnel program in higher education, legal and ethical aspects of counseling and student personnel work, and communication problems between groups within the institution and community.
654. **COLLEGE STUDENT DEVELOPMENT (5).** Pr., EDL 663. Developmental characteristics of college students, student culture and environment, student movements, research concerning the diversity of college student population and implications for counseling and student personnel programs.
656. **RESEARCH AND EVALUATION IN COUNSELING (5).** Pr., FED 661. COI. Measurement, appraisal, and evaluation of a broad range of objectives in counseling and guidance. Emphasis on criteria, techniques and research procedures necessary to evaluate counselor programs.
662. **PHYSICAL DIMENSIONS OF COUNSELING (5).** Pr., CED 621 or 622. Implementation of physical fitness skills to raise the energy level of the helper; use of physical fitness and challenge response activities as a tool in the helping relationship. (This course is also offered as HPR 662.)
695. **PRACTICUM, (1-15).** Experiences relating theory and practice, usually simultaneously.
699. **RESEARCH AND THESIS (CREDIT TO BE ARRANGED).** May be taken more than one quarter.
790. **FIELD PROJECT. (CREDIT TO BE ARRANGED).** May be taken more than one quarter.
799. **RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED).** May be taken more than one quarter.

Economics (EC)

Professors Hebert, *Head*, Chastain, Ekelund, Jones, Kern, Ritland, and Steele
Associate Professors Backhaus, Bellante, Jackson, Long, Street, and Whitten
Assistant Professors Garrison, Holcombe, Link, Morrell,
Saba, Scott, and Zardkoohi—Instructor Sherling

200. **ECONOMICS I (5).** Pr., sophomore standing. Economic principles with emphasis upon the macroeconomic aspects of the national economy. (Credit not allowed for this course and AEC 202.)
202. **ECONOMICS II (5).** Pr., EC 200. A continuation of economic principles with emphasis upon microeconomic aspects of the economy. (Credit not allowed for this course and AEC 206.)
206. **SOCIO-ECONOMIC FOUNDATIONS OF CONTEMPORARY AMERICA (3).** General elective. The social and economic developments which lead to and help toward an understanding of present day American society.
340. **ENVIRONMENTAL ECONOMICS (5).** Pr., EC 202 or COI. Economic analysis applied to topical environmental issues such as pollution, preservation vs. development, economic growth, and population.
350. **LABOR ECONOMICS (5).** Pr., EC 202, junior standing. A theoretical and institutional examination of the labor market, including wage theories, unionism, the economics of collective bargaining, and problems of insecurity.
360. **MONEY AND BANKING (5).** Pr., EC 200 or AEC 202, junior standing. Money, credit and banking including consideration of monetary systems, foreign exchange and commercial banking with relation to the Federal Reserve System.
400. **STUDENT INTERNSHIP PROGRAM (1-10).** Pr., junior standing and selection by the committee directing the School of Business Intern Program.

433. **LAW AND ECONOMICS (5).** Pr., EC 202 or COI, and junior standing. A description of the many substantive areas in which law has an economic foundation and an analysis of the ways in which law affects economic relations.

ADVANCED UNDERGRADUATE AND GRADUATE

551. **INTERMEDIATE MICROECONOMICS (5).** Pr., EC 202, and junior standing. The theory of pricing under varying market conditions and distribution of income among the factors of production.
552. **COMPARATIVE ECONOMIC SYSTEMS (5).** Pr., EC 202 and junior standing. An analysis of the rival economic doctrines of Capitalism, Socialism, and Communism.
553. **ECONOMICS OF GROWTH AND DEVELOPMENT (DESARROLLO ECONOMICO) (5).** Pr., EC 200 and junior standing, taught in English or Spanish. Concepts, principles and problems of economic growth and development with consideration of appropriate policies for both underdeveloped and advanced economies.
554. **HISTORY OF ECONOMIC THOUGHT (5).** Pr., EC 202 and junior standing. The development of economic ideas, principles, and systems of analysis from early times to the present.
555. **INDUSTRIAL ORGANIZATION (5).** Pr., EC 202 and junior standing. The relationship of market structure to the pricing behavior of business and industry. Selected topics: regulation, research, and development, technological change.
556. **INTERMEDIATE MACROECONOMICS (5).** Pr., EC 202 and junior standing. The measurement of national output, with income and employment theory, general equilibrium theory, and theories of interest, investment, and consumption.
557. **ECONOMIC HISTORY OF EUROPE (5).** Pr., EC 200 and junior standing. An analysis of the development of the European economy and the resulting impact on the United States and the world.
558. **ECONOMIC HISTORY OF THE UNITED STATES (5).** Pr., junior standing. The evolution of the American economy from European origins to the present.
559. **REGIONAL ECONOMIC DEVELOPMENT (5).** Pr., EC 200 and junior standing. Analytical discussion of the principles associated with the regional development of a national economy. Emphasis is on the problems of lagging regions and on the experience of the United States.
560. **INTRODUCTION TO ECONOMETRICS (5).** Pr., MH 161 or equivalent, AEC 206 or EC 202 or equivalent, and MN 274 or equivalent; junior standing. Formulation of elementary economic models using economic theory and mathematics with certain basic assumptions or axioms. Mathematical tools used in economic analysis. (Cross listed as AEC 560.)
562. **INTERMEDIATE MONETARY THEORY AND POLICY (5).** Pr., EC 360 and junior standing. Attention given to theoretical and empirical studies. Readings from original sources required.
565. **PUBLIC FINANCE (5).** Pr., EC 202 and junior standing. An examination of the economic rationale of the public sector; supply and demand of public goods. Principles of efficient and equitable taxation and government spending.
566. **BUSINESS HISTORY OF THE UNITED STATES (5).** Pr., junior standing. The origins and developmental patterns of American business with an emphasis on the role of the business community in the economic and political evolution of the United States. Not for graduate credit for Economics majors.
571. **INTERNATIONAL ECONOMICS (5).** EC 200, 202, and junior standing. An examination of the pure theory and monetary aspects of international trade.
580. **BUSINESS AND ECONOMIC FORECASTING (5).** Pr., EC 200, 202 and MN 274 or COI, and junior standing. Forecasting, with emphasis on the interpretation of macroeconomic forecasting methods and the development of competency in forecasting at the level of the firm.
585. **MATHEMATICAL ECONOMICS (5).** MH 161, EC 551, and 556, and junior standing. An introduction to mathematical methods in economics. Fundamental propositions of micro and macroeconomic theory are derived mathematically.

GRADUATE

501. **FOUNDATIONS OF ECONOMICS (5).** Pr., consent of the Director of the MBA Program, School of Business. An accelerated course combining both micro-and macroeconomics and implications for the manager.
600. **NATIONAL INCOME AND CAPITAL ACCUMULATION (5).** Pr., EC 551 and 556. Advanced general equilibrium theory. Emphasis on theories of interest, investment, and consumption.
601. **VALUE AND DISTRIBUTION (5).** Pr., EC 551 or COI. Positive content and limitations of modern theories of value, wages, rents, and profits.
607. **REGIONAL AND URBAN ECONOMICS (3).** COI, graduate standing. The economic forces involved in planning a dynamic urban region; the principles of and applications for regional economic models; the role of quantitative models of urban development in metropolitan policy-making.
611. **ECONOMIC DEVELOPMENT (5).** Pr., COI. Conceptual and empirical analysis of economic development with emphasis on the lesser developed areas and countries. Analysis of financial and technical aid to other countries and case studies of development problems.
622. **ADVANCED LABOR ECONOMICS (5).** Pr., EC 551 or COI. Advanced theories of wage determination and of theories and empirical studies of labor supply and mobility.
634. **ECONOMICS OF REGULATION (5).** Pr., EC 551. An analysis of contemporary theories of economic regulation and an examination of empirical evidence on effects of extra-market controls.

636. **SEMINAR IN INDUSTRIAL ORGANIZATION (5).** Pr., EC 551. Advanced studies in the determinants of market structure and the effects of market structure on industrial activity.
650. **ECONOMIC SEMINAR (1-10).** Pr., COI or graduate standing. Intensive study and analysis of economic problems.
651. **BUSINESS CONDITIONS ANALYSIS (3).** Pr., EC 501, MN 570 and 581 or equivalents. Macroeconomic theory as it relates to the business environment and business forecasting.
654. **ADVANCED HISTORY OF ECONOMIC THOUGHT (5).** Pr., EC 554 or COI. Critical survey of classical and neoclassical contributions to economics. Emphasis on the evolution of economic theory and the lessons of history for contemporary analysis.
656. **PRICE THEORY AND BUSINESS APPLICATIONS (3).** Pr., EC 501, MN 570, and 581 or equivalent. Microeconomic theories of the firm and markets and their applications to current business issues.
658. **SEMINAR IN THE ECONOMIC HISTORY OF THE UNITED STATES (5).** Pr., EC 558, COI or graduate standing. Recent developments in the field of knowledge constituting the economic history of the United States.
660. **ECONOMETRICS I (5).** Pr., EC 551 and MN 570. Probability theory, distribution theory, invariate regression theory, and other problems.
661. **ECONOMETRICS II (5).** Pr., EC 560. Multivariate regression theory, errors in variables, serial correlation, distributed lags, and other problems.
662. **SEMINAR IN MONEY AND BANKING (5).** Pr., EC 360 and COI. Goals, procedures, and achievements in attaining monetary objectives at home and abroad. Special emphasis is given to macro-money models explaining the effects of monetary policy actions on economic activity.
665. **SEMINAR IN PUBLIC FINANCE (5).** Pr., EC 565 or COI. Advanced microeconomic theory of the public sector.
671. **INTERNATIONAL ECONOMICS AND FINANCE (5).** Pr., EC 571. Advanced foreign trade theory and balance of payments analysis, exchange rates, capital movements, financial institutions. Current problems in international finance.
690. **SPECIAL PROBLEMS (1-5).** Variable content in the economics area.
699. **RESEARCH AND THESIS.** Credit to be arranged.

Educational Leadership (EDL)

Professors Walden, Head, Blackburn, Hayman, Krajewski, Morgan, Phillips, and Tincher
Associate Professors Brogdon, Martin, Scebra, and Williams
Assistant Professors Burkhalter, Lopusser, Mayfield, and Morris

Prerequisites and corequisites in the Department of Educational Leadership are experience in teaching or appropriate fields, and employment or definite professional objectives leading to employment in administration or supervision.

401. **ORGANIZATION AND SUPPORT OF PUBLIC EDUCATION (2).** The organization, administration and financing of American public education.
601. **ORGANIZATION AND ADMINISTRATION OF PUBLIC EDUCATION (5).** For superintendents, principals, teachers and other educational leaders. Topics include purposes of organization and administration; organization and administration on federal, state, and local levels; financial support and accounting; operation of plant; school-community interaction and personnel administration.
603. **SCHOOL FINANCE AND BUSINESS ADMINISTRATION (5).** Relationships between and among educational finance, educational program, tax structures, foundation programs and internal accounting. Theories of public finance and economic principles relating to financial support of educational systems at the local, state and federal levels.
605. **EDUCATIONAL BUSINESS MANAGEMENT (5).** Procedures and practices in educational finance at the business or operational level. Attention to budgeting, accounting, purchasing, transportation, cost analysis, and management of human and material resources.
607. **EDUCATIONAL PLANT MAINTENANCE (5).** Relationship of educational plant maintenance and operation to educational program; procedures in educational plant maintenance and operation; safety factors; trends in modernization and new plant planning.
609. **PERSONNEL ADMINISTRATION (5).** Assists educational leaders with effective personnel administration. Research results and experimentation in morale, welfare, work loads, pupil accounting, and bases for salary determination as they relate to staff and pupil personnel.
612. **CONSTITUTIONAL, STATUTORY AND JUDICIAL FOUNDATIONS OF EDUCATION (5).** The constitutional and statutory provisions for education and an analysis of judicial decisions affecting education. Among topics are authority and responsibility of the teacher; rights, privileges and responsibilities of students; use of school property, taxation, curriculum, contracts and retirement provisions; contractual capacity and liability and transportation.
620. **FUNDAMENTALS OF LEADERSHIP AND SUPERVISION (5).** Introductory studies of the leadership process including such topics as the theoretical framework in which leadership takes place; the purposes, functions and processes of supervision and leadership; administrative and supervisory tasks and skills; and the methods of evaluating leadership and supervisory roles.

621. **ADVANCED STUDIES OF EDUCATIONAL LEADERSHIP AND SUPERVISION (5).** Pr., EDL 620. Selection and development of supervisory techniques for improvement of classroom instruction; emphasis on interaction analysis, observation techniques, microteaching, team supervision, management by objectives.
623. **ADVANCED APPLICATION OF INSTRUCTIONAL SUPERVISION THEORY (5).** Pr., EDL 620. Selection and development of supervisory techniques for improvement of classroom instruction; emphasis on interaction analysis, observation techniques, microteaching, team supervision, management by objectives.
624. **CLINICAL SUPERVISION OF INSTRUCTION (5).** Pr., EDL 620, EDL 623. Theory of instruction, principles and process of clinical supervision; development of readiness for both the clinical supervision concept and implementation of clinical supervision techniques. Role playing and theoretical applications of clinical supervision will be effected.
625. **INTERNSHIP (5-15).** Provides advanced students with supervised, on-the-job experiences in a school, college, or other appropriate setting. These will be accompanied by regularly scheduled, on-campus discussion periods designed to provide positive evaluation and analysis of the intern experience.
630. **PRINCIPLES OF CURRICULUM AND INSTRUCTION (5).** Pr., FED 647 or COI. Advanced course directed toward providing students the knowledge and skill necessary for deriving principles to guide the processes of planning, designing, and evaluating curriculums in training and educational settings.
631. **CURRICULUM THEORIES (5).** Pr., EDL 630 or COI. Advanced study of major curriculum theories with emphasis on those theories which have special significance in the analysis of contemporary educational practice.
632. **THEORIES FOR DESIGNING INSTRUCTION (5).** Pr., EDL 630, FED 618 or COI. Advanced study and application of theories relating to processes for design of instruction for various educational settings, with emphasis on the development of personalized process models. Attention is given to the relationship of learning and instructional theories.
634. **CURRICULUM AND INSTRUCTION DEVELOPMENT (5).** Pr., EDL 630, EDL 631, and EDL 632. Utilization of curriculum and instruction theories and research for the purpose of developing comprehensive educational programs or courses for various types and levels of organizations.
635. **CURRICULUM AND INSTRUCTION APPLICATION (5).** Pr., EDL 634 and COI. Application of the processes of curriculum and instruction planning, implementation, and evaluation in an existing organization.
640. **EDUCATIONAL PLANT PLANNING (5).** Development of educational plants; relationships between curriculum and plant; trends in plant design; analysis of physical conditions, relationships of professional and lay personnel in educational plant planning.
646. **DIRECTED INDEPENDENT STUDY (1-6).** The student's learning efforts are guided toward desired objectives. Includes evaluation by professor and student at regular intervals.
647. **STUDIES FOR COMPREHENSIVE EDUCATIONAL PLANNING (5).** Principles and procedures for collecting, analyzing, and utilizing data in the process of educational planning, including such topics as community characteristics, including power structure, economic bases and population; system characteristics, including administrative organization, finance, personnel, physical facilities, and instructional program.
650. **SEMINAR IN AREA OF SPECIALIZATION (1-10).** Advanced graduate students and professors pursue cooperatively selected concepts and theoretical formulations.
652. **CURRENT PROBLEMS AND ISSUES IN EDUCATIONAL ADMINISTRATION (5).** The problems, issues, and trends affecting educational institutions with particular attention to development of administrative procedures to cope with the extensive changes occurring in education.
660. **ORGANIZATION AND ADMINISTRATION OF HIGHER EDUCATION (5).** Pr., EDL 663 or 665. For educational leaders in higher education. The organization, administration, and evaluation of institutions in higher education in terms of the academic program, student personnel services, business affairs, and related programs including relations between higher education and the state and federal government.
663. **THE AMERICAN COLLEGE AND UNIVERSITY (5).** Philosophy and function, the university and social change, the community college, academic freedom, student-faculty-community relationships; international flow of educational ideas, government cultural programs, higher education and the state.
665. **THE COMMUNITY COLLEGE (5).** The rise and development of the community/junior college in American education; its history, philosophy, and functions.
666. **UNDERGRADUATE INSTRUCTION IN HIGHER EDUCATION (5).** Pr., EDL 663 or 665 or COI. The development and selection of appropriate curricular materials and effective teaching strategies. Evaluation of instruction and learning effectiveness in undergraduate programs of higher education.
667. **PROBLEMS OF TEACHING THE marginally PREPARED COLLEGE STUDENT (5).** Pr., EDL 665, 666 or COI. Socioeconomic and cultural backgrounds as they affect learning styles of the marginally prepared student. Develop methods of appropriate teaching strategies as a means of improving the self-concept of these students.
668. **THE COMMUNITY COLLEGE PROGRAM (5).** The comprehensive community-junior college designed to improve competencies in program planning, evaluation, and administration.
669. **STUDENT PERSONNEL WORK IN HIGHER EDUCATION (5).** Pr., CED 621. Theories, principles, practices, organization, administration, and evaluation of student personnel services in higher education.
685. **ADMINISTRATIVE ORGANIZATION AND BEHAVIOR (5).** Current theories and concepts of formal organization and of collective behavior. Includes a social-psychological approach to organizations, and treats current trends in organizing of instruction.

686. **ADMINISTRATION AND POLICY FORMATION (5).** Analysis of basic social forces, antecedent movements, and political action leading to formal enactment of educational policy at national, state, and local levels. Consideration is given to the roles and functions of governing and regulating boards and agencies.
695. **PRACTICUM (1-15).** Students get experiences closely relating theory and practice, usually carried on simultaneously.

EDL courses 660, 663, 665, 666, 667, and 669, along with CED 653, and CED 654, constitute a core for the development of programs of study in higher education. Other offerings, in both academic and professional fields, are available for the completion of advanced programs. These include educational leadership; foundations of education; psychology; student personnel; vocational and technical education; professional and academic preparation for teaching in agricultural sciences; business administration, economics and sociology, English, health and physical education, history, home economics, mathematics, music, philosophy, physical and biological sciences, and speech.

The following research/field project credit options are available in each department according to the levels of degree study offered in the department.

699. **RESEARCH AND THESIS (Credit to be arranged).** May be taken more than one quarter.
798. **FIELD PROJECT (Credit to be arranged).** May be taken more than one quarter.
799. **RESEARCH AND DISSERTATION (Credit to be arranged).** May be taken more than one quarter.

Educational Media (EM)

Associate Professors Wright, *Acting Head*, Miller, and Smith
 Assistant Professors Countermeine, Mohajerin, and Nist
 Adjunct Instructor R. Wright

The programs in Educational Media may provide for certification at the A level and AA level for media specialists. Many courses are open to majors in other program areas of the school and the university.

200. **EDUCATIONAL MEDIA (2). LAB. (4).** Basic principles of library/media center usage includes audiovisual equipment operation, production of basic AV materials, and retrieval and utilization of library materials.
300. **LEARNING RESOURCES (4). LEC. 3, LAB. 2.** A survey of teaching and learning resources to include: (a) sources, access, and selection; (b) familiarity with materials and equipment; (c) planning for instructional use, and (d) producing and using resources in instruction.

ADVANCED UNDERGRADUATE AND GRADUATE

500. **EDUCATIONAL MEDIA PROGRAMS (4).** Pr., junior standing. The role of media in education and the development of the school media program. Personnel functions in information and instructional media services.
510. **MEDIA FOR CHILDREN (4).** Evaluation of print and other types of materials in view of the needs and interests of various age and grade levels of elementary school children. Study of selection aids, principles, and criteria for selecting materials.
515. **MEDIA FOR YOUNG ADULTS (4).** Evaluation of books and other media in relation to the interests, needs, and abilities of young adults.
530. **REFERENCE MATERIALS AND SERVICES (4).** Evaluation of basic reference sources for learning resource centers. Introduction to research methods needed in locating information to support the curriculum of the school.
540. **ORGANIZATION AND ADMINISTRATION OF MEDIA CENTERS (4).** Pr., EM 500 or concurrent with EM 500. Basic organization of books, non-book materials, and services for effective use in media centers. Administering the budget, selection and purchase of materials, preparation of materials for use, circulation of materials, inventory, care and repair of materials, and instruction in the use of media are considered.
550. **CLASSIFICATION AND CATALOGING OF MEDIA (4).** Pr., EM 300 or concurrent with EM 500. Principles and procedures of classifying and cataloging books and other printed materials, filmstrips, recordings, and community resources. The vertical file, the Dewey decimal system of classification, Wilson and Library of Congress printed cards, and subject headings are studied.
570. **CYBERNETIC PRINCIPLES OF LEARNING SYSTEMS (4).** The organization of instruction into learning systems utilizing feedback control and modification. Includes implications for instructional design in the continuous progress school with special emphasis on the media center.

GRADUATE

600. **TECHNOLOGY IN EDUCATION (4).** Pr., EM 300 or equivalent. Theory, problems, procedures, and standards in the utilization of technology.
601. **INSTRUCTIONAL MATERIALS SELECTION AND PREPARATION (4).** LEC. 2, LAB. 4. Selection and preparation of materials for instruction, consistent with principles of learning and teaching. Practical work includes design, preparation, and validation of materials.
605. **MODES OF MEDIATED INSTRUCTION (4).** Pr., EM 800. Development and integration of media into learning prescriptions. Emphasis is on the selection of appropriate media for specific learning tasks.
610. **SELECTION AND USAGE OF MEDIA FOR YOUTH (4).** Pr., EM 510, 515, or COI. Evaluation, selection, and use of print and non-print media for children and young adults, including materials for multicultural, special, gifted education.
620. **PROGRAMS AND PRINCIPLES OF MEDIA SERVICES (5).** Pr., EM 540 or COI. Place and function of media services in school programs. Functions of school media personnel in leadership and principle application in media program development. Course work includes Practicum experience.
625. **INTERNSHIP (3-15).** Provides advanced students with supervised, on-the-job experiences in a school, college, or other appropriate setting. These experiences will be accompanied by regularly scheduled, on-campus discussion periods to provide positive evaluation and analysis of the intern experience.
626. **PROBLEMS IN THE ADMINISTRATION OF MEDIA SERVICES (4).** Pr., EM 605, 620, or COI. Current problems relating to an effective program of media services. Experiences include problem identification and resolution in the field.
630. **COMMUNITY INFORMATION AND REFERENCE SOURCES (4).** Pr., EM 500 and 530. The use of reference sources, information networks, community surveys and group decision-making in relating school media programs to the community.
646. **DIRECTED INDEPENDENT STUDY. (1-10).** Special study in which the student's learning efforts are guided toward desired objectives. Includes evaluation by professor and student of work accomplished at regular intervals.
650. **SEMINAR IN EDUCATIONAL MEDIA (1-10).** May be repeated for credit not to exceed 10 hours. Provides an opportunity for advanced graduate students and professors to pursue cooperatively selected concepts and/or theoretical formulations.
651. **RESEARCH STUDIES IN EDUCATIONAL MEDIA (4).** Pr., FED 861 and 18 hours of appropriate media courses including EM 800 or equivalent. Review, analysis, and interpretation of available research with emphasis on designing new research to meet the changing needs of the school.
654. **EVALUATION OF PROGRAM IN EDUCATIONAL MEDIA (4).** Pr., FED 661 and 18 hours of appropriate media courses including EM 600 or equivalent. Evaluation and investigation of teaching effectiveness with attention also given to the utilization of human and material resources and the coordination of areas of specialization.
695. **PRACTICUM (1-15).** Experiences closely relating theory and practice, usually carried on simultaneously.
696. **GRADUATE RESEARCH FORUM (1).** May be repeated but counted only once toward graduation. Presentations by graduate students of research proposals and/or findings. Analysis of procedures and findings.
699. **RESEARCH AND THESIS. (Credit to be arranged.)** May be taken more than one quarter.
798. **FIELD PROJECT. (Credit to be arranged.)** May be taken more than one quarter.

Electrical Engineering (EE)

Professors Irwin, Head, Boland, C. Carroll, Graf

Lowry, Nagle, Phillips, and Russell

Alumni Associate Professors Kerns and Jaeger

Associate Professors Cook, Feaster, Gross

Rogers, Shumpert, and Slagh

Assistant Professors James, Nelson, Starks, and Schiffman

Adjunct Assistant Professor Diehl

201. **INTRODUCTION TO COMPUTER PROGRAMMING (3).** An introduction to the Basic and Fortran computer languages with emphasis on the use of the digital computer as an engineering tool.
202. **TIMESHARING AND TERMINAL SYSTEMS (2).** Not open to EE majors. Time-shared computer systems, remote terminals, terminal languages, and system applications.
261. **LINEAR CIRCUIT ANALYSIS I (3).** Coreq., PS 222, MH 265. Basic laws and concepts; resistive circuits, linear algebra, R-L and R-C circuits.
263. **LINEAR CIRCUIT ANALYSIS II (4).** Pr., EE 261. Coreq., EE 264 for EE students. Sinusoidal forcing functions and phasors; steady-state response, average power and RMS values, polyphase circuits, Fourier analysis, and magnetically coupled circuits.
264. **LINEAR CIRCUIT ANALYSIS II LABORATORY (1).** LAB. (3). Coreq., EE 263. Experiments in electrical circuits.

- 300. FUNDAMENTALS OF ELECTRICAL ENGINEERING (5).** Coreq., MH 265, PS 222. An introduction to the fundamental concepts of electrical engineering with emphasis on topics in circuits, electronics, and energy conversion. (Not open to Electrical Engineering majors.)
- 301. ENGINEERING INSTRUMENTATION (3).** LEC. 2, LAB. 3. Pr., EE 263. Principles of instrumentation. The detection and measurement of physical quantities with emphasis on transducers, signal processing, and display.
- 330. ANALYSIS AND DESIGN OF LOGIC CIRCUITS (4).** LEC. 3, LAB. 3. Pr., EE201, junior standing, or COI. Binary numbers, Boolean algebra, Boolean functions, truth tables and Karnaugh maps; Gates and flipflops; combinational and sequential logic circuits; design methods and design verification; logic families and logic technologies.
- 335. COMPUTER ORGANIZATION AND ASSEMBLY LANGUAGE PROGRAMMING (4).** LEC. 3, LAB. 3. Pr., EE 330. Stored program computers, hardware components, software components; data representation and number systems; instruction sets, addressing modes, and assembly language programming; subroutines and macros; assemblers; loaders, linkers, and operating systems; memory, memory cycle and memory hierarchy, arithmetic/logic unit; control unit, program counter, and instruction cycle; input/output, input/output programming, and interrupts.
- 351. LINEAR FEEDBACK SYSTEMS (4).** Pr., EE 362. Transfer functions, transient and steady state performance, stability, design and compensation of feedback control systems.
- 352. NONLINEAR AND SAMPLED-DATA SYSTEMS ANALYSIS (4).** LEC. 3, LAB. 3. Pr., EE 351. Describing functions; phase plane analysis; sampled-data systems, use of state space concepts.
- 362. LINEAR SYSTEMS (5).** LEC. 4, LAB. 3. Pr., MH 266, EE 263, 264. Fourier Series, Fourier transforms, Laplace transforms, state space analysis.
- 371. ELECTRONICS I (3).** Pr., EE 263 or 300. Semiconductors, principles of electronic devices, design of low frequency electronic circuits.
- 374. ELECTRONICS II (4).** Pr., EE 371. Integrated circuits, high frequency limitations of electronic devices, frequency response, feedback, design of high frequency and feedback electronic circuits.
- 385. POWER SYSTEM ANALYSIS I (4).** Pr., EE 263 or 300. Basic power system terminology, Synchronous machines, transmission lines, and transformer system models, Symmetrical components and load flow analysis.
- 391. ELECTROMAGNETIC PRINCIPLES I (3).** Pr., PS 222. Scalar and vector fields, the electrostatic field, the magnetostatic field, Maxwell's equations, boundary conditions, uniform plane waves.
- 392. ELECTROMAGNETIC PRINCIPLES II (3).** Pr., EE 391. An engineering approach to paraxial matrix optics, the wave properties of light, and the Fourier analysis approach to physical optics.
- 397. INTRODUCTION TO ACOUSTICS AND NOISE CONTROL (3).** Pr., MH 265 or COI. Terminology and units, hearing loss, regulations, instrumentation, noise sources, room acoustics, walls, enclosures, barriers, acoustical materials and vibration control.
- 398. INTRODUCTION TO DISCRETE SYSTEMS (3).** Pr., EE 362. Introduction to discrete-time signal processing, recursive and non-recursive digital filters, and spectral analysis. Discrete Fourier transforms and fast Fourier transforms.
- 430. COMPUTER SYSTEM DESIGN (4).** LEC. 3, LAB. 3. Pr., EE 335. Computer I/O, I/O hardware, programmed I/O, interrupts, DMA, and I/O programming, microprocessors, support chips, peripherals, and programming; system specification, design, and verification.
- 441. COMMUNICATION THEORY (5).** LEC. 4, LAB. 3. Pr., EE 475, IE 311. Spectral analysis. Amplitude, angle and pulse modulation, and demodulation techniques.
- 475. ELECTRONICS III (5).** LEC. 4, LAB. 3. Pr., EE 330, 374. Oscillators, IC operational amplifiers, linear analog systems, nonlinear analog systems, IC logic families, power circuits.
- 481. ELECTROMECHANICAL ENERGY CONVERSION (5).** Coreq., EE 385. Basic concepts in electromagnetic-mechanical energy conversion. Linear and nonlinear analysis of transformers, dc machines, synchronous, and induction machines. Operation in the generator and motor modes.
- 489. ELECTROMECHANICAL ENERGY CONVERSION LABORATORY (2).** LAB. 6. Coreq., EE 481. Experiments involving electromechanical energy conversion devices.
- 490. SPECIAL TOPICS. CREDIT TO BE ARRANGED.** Pr., COI. May be taken more than one quarter.
- 492. ELECTROMAGNETIC PRINCIPLES III (4).** LEC. 3, LAB. 3. Pr., EE 392. Analysis and design of distributed systems including plane wave reflection and transmission, transmission lines and waveguides, coordinated laboratory experiments and demonstrations.
- 499. SPECIAL PROJECTS. CREDIT TO BE ARRANGED.** Pr., COI. May be taken more than one quarter.

ADVANCED UNDERGRADUATE AND GRADUATE

- 520. FUNDAMENTALS OF COMPUTER GRAPHICS SYSTEMS (4).** LEC. 3, LAB. 3. Pr., EE 430, IE 300 or the equivalent, COI. Hardware and software components of computer graphics systems; display files, two-dimensional and three-dimensional transformations, clipping and windowing, perspective, hidden-line elimination and shading; interactive graphics; survey of applications.

521. **INTRODUCTION TO ARTIFICIAL INTELLIGENCE AND ROBOTICS (4). LEC. 3, LAB. 3.** Pr., EE 526 or 527. Software and hardware pertaining to the design of intelligent computer systems. Problem representation, game playing. State space search techniques, problem reduction search techniques, Mini Maxing-Alpha Beta Pruning; sensors, transducers optics; automatic controllers, numeric controller machines, industrial and research robots.
523. **FAULT DIAGNOSIS OF DIGITAL SYSTEMS (3).** Pr., EE 430 and COI. Fault testing for combinational and sequential logic circuits, fault models, test generation, diagnosis of logic systems, implications in design.
524. **MICROCOMPUTERS (3).** Pr., EE 430 or COI. Microcomputer chip sets, microcomputer system design, machine programming, PROM programming, interfacing, applications, bit-sliced microprocessors, advanced microprocessor/microcomputer architectures.
525. **MICROCOMPUTER LABORATORY (1), LAB. 3.** Coreq. EE 524 or COI. Students design and build a microcomputer system and do an application project.
527. **SYSTEMS PROGRAMMING AND OPERATING SYSTEMS (3).** Pr., EE 335, and COI. An introduction to assembly languages, assemblers, macro processors, loaders, higher level languages, and operating systems.
528. **COMPILER CONSTRUCTION (3).** Pr., EE 527. Review of language structures, system programs, and storage allocation. Compilation of statements and expressions. Compiler organization, symbol tables, scanning, object code generation, diagnostics, code optimization, compiler writing languages, and bootstrapping.
530. **COMPUTER ENGINEERING SEMINAR (1).** Pr., COI. May be repeated for credit but no more than one hour can be applied to a master's degree or more than three hours to a doctoral degree. Invited speakers, faculty, and graduate students present results of their research activities.
543. **COMMUNICATION SYSTEMS (3).** Pr., EE 475. Impedance matching, filtering, transmitters and receivers, telemetry, radar, image transmission, lasers.
547. **INTRODUCTION TO DIGITAL SIGNAL PROCESSING (5).** Pr., EE 398 or 441. Introduction to digital filters, the discrete Fourier Transform, and their applications in signal processing.
551. **HYBRID COMPUTATION (5). LEC. 4, LAB. 3.** Pr., EE 352. Analog computer simulation of physical systems; logic control of analog computers; digital computer simulation of physical systems; hybrid computation; use of the computer as a design tool.
552. **MODERN DIGITAL CONTROL SYSTEMS (3).** Pr., EE 352. Linear algebra, state variable modeling, dynamic programming, optimal design, estimation of dynamic states.
553. **MICROPROCESSORS IN CONTROL SYSTEMS (4). LEC. 3, LAB. 3.** Pr., EE 430. Coreq., EE 352. Electrical transducers. Characteristics of operational amplifiers used for instrumentation. Signal conditioning operations. Data conversion systems. Signal transmission methods. Process controllers. Microprocessor controller examples.
570. **ELECTRICAL PROPERTIES OF MATERIALS (3).** Pr., EE 392. PS 320. Studies of the electrical properties of materials with emphasis on semiconductors.
571. **PHYSICAL ELECTRONICS (3).** Pr., EE 570. Physical properties of electrical and electronic devices.
572. **MICROELECTRONICS (3). LEC. 2, LAB. 3.** Pr., EE 374. Monolithic integrated circuit technology, thick and thin film hybrid circuits, fabrication and applications.
574. **INTRODUCTION TO NOISE IN ELECTRONICS (3).** Pr., EE 374, 392, PS 320. Noise in solid state devices and circuits, low noise circuit design, noise characterization, and computer-aided noise analysis.
575. **LINEAR INTEGRATED CIRCUIT DESIGN (3)** Pr., EE 374. Design of analog circuits; current sources, input/output states, gain stages, multipliers, multiplexers, phase-locked-loops active filters.
576. **DIGITAL INTEGRATED CIRCUIT DESIGN (3).** Pr., EE 374. Design of digital integrated circuits, applications, solid state device switching characteristics, memory, displays testing.
582. **POWER ELECTRONICS (3).** Pr., EE 481 or COI. Polyphase power rectifiers and inverters. Solid state drives for rotating machines. Characteristics of high power solid state components.
585. **POWER SYSTEM ANALYSIS II (3).** Pr., EE 385 or COI. Symmetrical components and analysis of unbalanced faults on power systems. Relay and protection schemes.
586. **DIRECT ENERGY CONVERSION (3).** Pr., EE 481, 391, ME 301, or COI. Fundamentals and energy consideration, thermoelectric devices, photovoltaic devices, thermionic devices, magnetohydrodynamic power generation, batteries and fuel cells. Ecological consideration.
587. **MATRIX ANALYSIS OF ELECTRICAL MACHINES (3).** Pr., EE 481. Matrix algebra; linear transformations, symmetrical components; the generalized machine; direct current machines; induction machines; synchronous machines.
588. **POWER SYSTEM RELIABILITY (3).** Pr., MH 266, EE 385, or COI. Reliability techniques applied to the planning and design of generation, transmission, and distribution facilities of electrical power systems.
590. **SPECIAL TOPICS. CREDIT TO BE ARRANGED.** Pr., COI. May be taken more than one quarter.
591. **INTRODUCTION TO ELECTROMAGNETIC COMPATIBILITY AND INTERFERENCE (3).** Pr., EE 362, 371, 391. Electrical noise suppression and control in electrical systems.
592. **RADAR SYSTEMS (3).** Pr., EE 392. Introduction to the fundamentals of radar systems.
594. **NONLINEAR OPTICAL SYSTEMS (3).** Pr., EE 392. Holography, polarization, nonlinear optics, sources, and detectors.

595. **MICROWAVE COMPONENTS AND SYSTEMS (3).** Pr., EE 492. Analysis of distributed systems including generation and detection of microwave energy, microwave components and systems, coordinated laboratory experiments and demonstrations.
596. **PHASED ARRAY ANTENNA SYSTEMS (3).** Pr., EE 392. Analysis and design of phased array radiating structures and systems, system performance measurement techniques, coordinated laboratory experiments and demonstrations.
597. **SONAR SYSTEMS (3).** Pr., EE 398 or 547. Introduction to underwater sound and sonar systems. Fundamental sonar equations and underwater sound generation and propagation. Noise levels in the sea and the effects of reverberation and scattering. Signal detection.

GRADUATE

601. **LINEAR ANALYSIS (5).** Methods of analysis, the exponential forcing function, Fourier series, Fourier transform, Laplace transform, and superposition integrals. Complex variables and contour integration.
610. **ADVANCED TOPICS IN ELECTRICAL POWER SYSTEMS (5).** Pr., EE 585, or COI. Power system transients, economic dispatch, Optimum operation of power systems, HVDC, the governor-exciter-generator system.
612. **ADVANCED TOPICS IN ELECTROMECHANICAL ENERGY CONVERSION (5).** Pr., COI. Dynamic equations of motion of electromechanical systems; the generalized rotating electromechanical energy converter; dynamics of systems; the n -m symmetrical machine.
620. **NONDETERMINISTIC SYSTEMS ANALYSIS (3).** Pr., COI. Applications of probability, random variables, and stochastic processes in Electrical Engineering.
621. **SWITCHING THEORY I (4).** Pr., EE 330 or equivalent. Special topics in switching theory and digital design. Multiple level circuits, decomposition, threshold and multiple-valued logic, linear sequential circuits, and issues in asynchronous sequential circuit design.
622. **SWITCHING THEORY II (4).** Pr., EE 621 or equivalent. Algebraic structure of sequential machines; modular logic design, universal logic modules, array realizations, programmable logic arrays, physical circuit design, partitioning, placement, routing; magnetic bubble logic; fault diagnosis; fault-tolerant design.
623. **CODING THEORY (3).** Pr., EE 330. Error detection and correction, linear codes, cyclic codes, BCH codes, coding bounds, shift register sequences, and coding systems.
626. **DIGITAL COMPUTER ARCHITECTURE I (3).** Pr., EE 430, or equivalent. Structures for the central digital computer are studied; arithmetic units, machine language features, information transfer, memory hierarchy, channels.
627. **DIGITAL COMPUTER ARCHITECTURE II (3).** Pr., EE 626. Parallelism in hardware and software. High speed processors, multiple machines, multiprogramming, and multiprocessing.
636. **COMPUTER NETWORKS AND DATA COMMUNICATIONS (3).** Pr., EE 430 or COI. Introduction to distributed systems, network architectures, protocols, digital communication links, data management, and related software design.
640. **DIGITAL COMPUTING SYSTEMS (3).** Pr., EE 626. Present and next generation digital computers; minicomputers, multiprocessors, business and scientific oriented models; diverse uses of digital computers today, future trends and applications for digital computers.
641. **LINEAR NOISE THEORY (5).** Pr., EE 620 or COI. Probability, noise processes, correlation, power spectra, noise through linear systems, matched filters, Wiener filters, prewhitening, parameter optimization.
642. **FAULT TOLERANT COMPUTING (3).** Pr., EE 523, 623 or COI. Architecture and design of fault tolerant computer systems using protective redundancy, estimation of the reliability and availability of fault tolerant systems, error recovery, and fault diagnosis.
643. **COMPUTER SOFTWARE DEVELOPMENT (3).** Pr., EE 527, or equivalent. Programming systems and languages, interactive systems, philosophy of operating systems, program-program interfaces, problems in data management, software maintenance and reliability.
644. **THEORY OF COMPILERS (3).** Pr., EE 528, or equivalent. Formal properties of grammars, syntactic analysis, lexical analysis, analytical modeling, macro generators, code selection, hard-wired compilers, and extensible languages are typical topics studied.
645. **DETECTION, ESTIMATION AND MODULATION THEORY (5).** Pr., EE 641 or COI. Hypothesis testing, parameters in Gaussian noise, estimation of continuous waveforms, linear estimation.
646. **ARTIFICIAL INTELLIGENCE AND PATTERN RECOGNITION (3).** Pr., EE 521. Heuristic Programming, LISP, Correlation methods, discriminant analysis, maximum likelihood decisions, minimax techniques, perception-like algorithms, features, extractions, pre-processing, clustering and nonsupervised learning.
647. **THEORY OF DIGITAL SIGNAL PROCESSING (5).** Pr., EE 547. Finite and infinite impulse response digital filters, finite word length effects, two dimensional signal processing hardware schemes and applications.
- 650-651. **ELECTROMAGNETIC THEORY AND APPLICATIONS I-II (3-3).** Pr., COI. A two course sequence for students specializing in electromagnetics.
652. **TRANSIENT ELECTROMAGNETIC FIELDS (3).** Pr., COI. Fourier transform, Laplace transform and direct time domain solution techniques for transient problems in advanced applied electromagnetics.
653. **ANTENNAS (3).** Pr., COI. Advanced treatment of radiating systems.
- 654-655. **NUMERICAL METHODS IN APPLIED ELECTROMAGNETICS I-II (3-3).** Pr., COI. A two course sequence for students specializing in electromagnetics.

- 657-658. ADVANCED ENGINEERING OPTICS I-II (3-3).** Pr., COI. An advanced course in engineering optics and optical systems, geometrical and physical optics methods in depth.
- 670. INFORMATION THEORY (3).** Pr., COI. Signal descriptions; spectral representation; random variables and processes; information measures; channel models; coding theorems.
- 671. SOLID STATE ELECTRONICS I (3).** Pr., EE 570 or COI. Transport properties of semiconductors, band structure, carrier lifetime, current flow, junction theory.
- 672. SOLID STATE ELECTRONICS II (3).** Pr., EE 571 or COI. Advanced physical theory of pn junctions and bipolar junction transistors, modeling theory, high level injection effects, large signal analysis, and second order effects.
- 673-674. COMMUNICATION SYSTEMS I-II (3-3).** Pr., COI. RF circuitry; impedance matching networks; oscillators; mixers; modulators; detectors; RF amplifiers; high frequency devices; integrated subsystems; testing and measuring techniques in RF systems.
- 675. ANALOG ELECTRONIC CIRCUITS (3).** Pr., COI. Analysis, design, and application of discrete and integrated electronic devices in analog circuitry. Amplifiers; active filters; integrators; multipliers; dividers; logarithmic converters. Speed capability and noise considerations.
- 677. ELECTRONIC SWITCHING CIRCUITS I-II (3-3).** Pr., COI. Analysis, design, and application of discrete and integrated electronic devices in switching circuitry. Wave shaping; integrated circuit logic families; gating; wave generation; counting; timing; memory.
- 679. SOLID STATE ELECTRONICS III (3).** Pr., COI. Advanced theory of field effect devices.
- 680. DIRECTED READING IN ELECTRICAL ENGINEERING. CREDIT TO BE ARRANGED.**
- 681-682-683. AUTOMATIC CONTROL THEORY I-II-III (4-4-3).** Pr., COI. Advanced analysis and design of control systems, including modern and classical control theory as applied to linear, nonlinear, continuous, and discrete systems.
- 690. SPECIAL TOPICS. CREDIT TO BE ARRANGED.** Pr., COI. May be taken more than one quarter.
- 691-692-693. ADVANCED AUTOMATIC CONTROL THEORY I-II-III (3-3-3).** Pr., COI. Optimal control theory for deterministic and non-deterministic systems; optimal linear filter theory; modern stability theory.
- 695. SEMINAR. CREDIT TO BE ARRANGED.** Pr., COI. May be taken more than one quarter.
- 698. SPECIAL PROJECTS. CREDIT TO BE ARRANGED.** Pr., COI. May be taken more than one quarter.
- 699. RESEARCH AND THESIS. CREDIT TO BE ARRANGED.** May be taken more than one quarter.
- 799. RESEARCH AND DISSERTATION. CREDIT TO BE ARRANGED.** May be taken more than one quarter.

Elementary Education (EED)

Professors Coss, Head, and Cadenhead

Associate Professors Allen, English, Kaplan, Noland, Wilson, and Wright

Assistant Professors Jensen, Silvern, Surbeck, Taylor, vonEschenbach, Williamson, and Worden

Instructor Schillings

Orientation

- 102. ORIENTATION FOR TRANSFER STUDENTS (1).** Helps transfers from other curricula and students pursuing the dual objectives program to understand teacher education and teaching as a profession.
- 104. ORIENTATION TO LABORATORY EXPERIENCES FOR TRANSFERS (1).** Required of all students completing the Teacher Program. Orientation to the total Laboratory Experiences Program in the School of Education with specific attention to the orientation and initiation of the Pre-Teaching Field Experience Program.

Reading Improvement

Available as a service course and as a general elective to all University students.

- 310. READING IMPROVEMENT (3). LEC. 2, LAB. 2. 5-U Only.** General elective. Developmental reading for students who wish to improve their reading skills. Each student's present degree of reading efficiency is diagnosed and a program structured to his individual needs is planned and conducted.

Curriculum and Teaching

Students are sectioned by area of specialization according to the following designations in certain core courses: (A) Early Childhood, (B) Elementary, (C) Special Behavior Disturbance, (D) Special Mental Retardation, (E) Special Early Childhood for the Handicapped.

- 301. CURRICULUM I (10). LEC. 8, LAB. 6.** Admission to Teacher Education, junior standing. Understandings, skills, and attitudes necessary for planning and implementing language arts and social science curricula are developed in an individualized teaching-learning setting. Laboratory experiences are required.

302. **CURRICULUM I, LANGUAGE ARTS (5).** LEC. 4, LAB. 3. Pr., admission to Teacher Education, junior standing.
303. **CURRICULUM I, SOCIAL SCIENCE (5).** LEC. 4, LAB. 3. Pr., admission to Teacher Education, junior standing.
315. **LANGUAGE DEVELOPMENT: IMPLICATIONS FOR THE CHILDHOOD EDUCATOR (4).** Applications of language development theories to teaching children. Emphasis on effects theories have on curriculum and teaching.
320. **CURRICULUM FOR EARLY CHILDHOOD EDUCATION I (10).** LEC. 8, LAB. 6. Pr., admission to Teacher Education, junior standing. Language Arts and Social Science curricula appropriate for children ages four through eight. Laboratory experiences are required.
355. **SURVEY OF EARLY CHILDHOOD EDUCATION (3).** Pr., admission to Teacher Education, junior standing. Survey of the teaching profession, the nature of programmatic variation at the early childhood level.
370. **FUNDAMENTALS OF READING INSTRUCTION I (5).** LEC. 3, LAB. 4. Pr., sophomore standing. Develops competencies in the teaching of reading. Introduces student to the basic aspects of teaching reading. Fundamental constructs considered are readiness, informal diagnosis, reading skills, planning, approaches, enjoyment of reading, learners with special needs.
371. **FUNDAMENTALS OF READING INSTRUCTION II (5).** LEC. 3, LAB. 4. Pr., EED 370 or COI. Builds on EED 370 in developing competencies in the teaching of reading. Topics include: word recognition, comprehension, and study skills (teaching level), the basal reader and individualized approaches, lesson planning, diagnostic teaching of reading. Commercial materials are evaluated and teacher-made materials are produced. Laboratory experiences with children.
401. **CURRICULUM II (10).** LEC. 8, LAB. 6. Pr., coreq. FED 350 or 400, junior standing. Understanding, skills, and attitudes necessary for planning and implementing elementary mathematics and natural science curricula are developed in an individualized teaching-learning setting. Laboratory experiences are required.
402. **CURRICULUM I, MATHEMATICS (5).** LEC. 4, LAB. 3. Pr., junior standing.
403. **CURRICULUM II, NATURAL SCIENCE (5).** LEC. 4, LAB. 3. Pr., junior standing.
420. **CURRICULUM FOR EARLY CHILDHOOD EDUCATION II (10).** LEC. 8, LAB. 6. Pr., admission to Teacher Education, junior standing. Mathematics and natural science curricula appropriate for children ages four through eight. Laboratory experiences are required.
425. **PROFESSIONAL INTERNSHIP (15).** Pr., senior standing, admission to Teacher Education prior to internship, appropriate professional courses. Provides supervised, on-the-job experiences in a school, college, or other appropriate setting. These experiences will be accompanied by regularly scheduled discussion periods designed to provide positive evaluation and analysis of the intern experience.
446. **DIRECTED INDEPENDENT STUDY (1-10).** The student's learning efforts are guided toward desired objectives. Includes evaluation by professor and student of work accomplished at regular intervals.
450. **SPECIAL TOPICS (1-5).** Seniors and professors pursue cooperatively selected concepts and theoretical formulations normally in small groups.
451. **ANALYSIS OF ELEMENTARY INSTRUCTIONAL STRATEGIES (3).** LEC. 2, LAB. 2. Pr., Professional Internship. Patterns of elementary curriculum and organization for instruction, including the analysis of previous and current laboratory experiences in education. Attention given to implementation of systems approach in student's area of specialization.
495. **PRACTICUM (1-10).** Provides experiences closely relating theory and practice, usually carried on simultaneously.

ADVANCED UNDERGRADUATE AND GRADUATE

570. **READING IN THE CONTENT AREAS IN THE ELEMENTARY SCHOOL (5).** LEC. 3, LAB. 4. Pr., EED 300 and junior standing. Develops competencies in teaching functional reading in the elementary school. Directed reading activities, specialized skills, and study skills stressed.
574. **PROBLEMS IN IMPROVEMENT OF READING AT THE ELEMENTARY SCHOOL LEVEL (5).** LEC. 3, LAB. 4. Develops competencies in teaching functional reading in the elementary school. Directed reading activities, specialized skills, and study skills stressed.

GRADUATE

600. **FIRST AND SECOND LANGUAGE ACQUISITION OF THE BILINGUAL CHILD (5).** Language acquisition theories; second language learning; characteristics of the speaker's native language; and psychological and linguistic differences between English and the native language. Review, use, and analysis of language assessment instruments in bilingual education.
620. **THE EARLY CHILDHOOD EDUCATION PROGRAM (3-10).** Pr., bachelor's degree. Curriculum, teaching-learning process, materials, and facilities appropriate for young children will be studied in a laboratory environment.
621. **ANALYSIS OF EARLY CHILDHOOD EDUCATION PROGRAMS (4).** Pr., EED 620. Analysis of model programs with distinctive philosophies, theoretical frameworks, goals, materials, and practices.
624. **RESEARCH IN EARLY CHILDHOOD EDUCATION (5).** Pr., EED 621. Review, analysis, and interpretation of research in early childhood education.
625. **INTERNSHIP (5-15).** Supervised, on-the-job experiences in a school, college, or other appropriate setting. These experiences accompanied by regularly scheduled, on-campus discussion periods for positive evaluation and analysis of the intern experience.

- 640. DIAGNOSTIC AND CORRECTIVE TEACHING OF READING (4).**
- 641. DIAGNOSTIC PROCEDURES IN READING (5).** Pr., EED 661 or consent of department head. Administration, scoring and interpretation of specific reading tests to determine causes of reading disability. Formal and informal evaluation procedures for regular and remedial classrooms. Screening tests for contributing factors to reading disability. Analysis and implication for correction of reading difficulties.
- 642. REMEDIAL PROCEDURES IN READING (5). LEC. 3, LAB. 4.** Pr., EED 641 or consent of department head. Individual and group techniques for correcting deficiencies and practice in continuing evaluation of reading difficulties. Use of equipment and materials with children having reading problems.
- 646. DIRECTED INDEPENDENT STUDY (1-6).** The student's learning efforts are guided toward desired objectives. Includes evaluation by professor and student of work accomplished at regular intervals.
- 649. THE ELEMENTARY SCHOOL PROGRAM (5).** Major curriculum areas and teaching practices in the modern elementary school. Attention given to implications of research and theory for the total elementary school program.
- 650. SEMINAR IN ELEMENTARY EDUCATION. (3-10).** May be repeated for credit not to exceed 10 hours.

Each of the following courses, 651, 652, 653, and 654 applies to the following areas of the elementary school program: (A) Early Childhood, (B) Elementary Education, (G) Language Arts, (H) Mathematics, (J) Music, (K) Science, (L) Social Science, (R) Reading, and (S) Bilingual.

- 651. RESEARCH STUDIES IN EDUCATION IN AREAS OF SPECIALIZATION (5).** Review, analysis, and interpretation of available research with emphasis on designing new research to meet the changing needs of the school.
- 652. CURRICULUM AND TEACHING IN AREAS OF SPECIALIZATION (5).** Teaching practices and reappraisal of selecting experiences and content for curriculum improvement.
- 653. ORGANIZATION OF PROGRAM IN AREAS OF SPECIALIZATION (5).** Program, organization, and development of basic and supplementary materials for guiding teachers, faculties, and school systems in the continuous improvement of curriculum and teaching practices.
- 654. EVALUATION OF PROGRAM IN AREAS OF SPECIALIZATION (5).** Evaluation and investigation of teaching effectiveness with attention also given to the utilization of human and material resources and the coordination of areas of specialization.

Prerequisites for the 651, 652, 653, and 654 courses are 18 hours of appropriate subject matter and 36 hours of psychology and professional education.

- 656. DIRECTED INDIVIDUAL STUDY IN READING DIAGNOSIS AND READING REMEDIATION (5).** Pr., EED 642 or consent of department head. Clinical experiences in diagnosing problems in reading and related areas. Also clinical experiences in the remediation of reading problems.
- 657. INDIVIDUALIZING INSTRUCTION IN ELEMENTARY SCHOOLS (5).** Analysis of programs of individualizing instruction. Emphasis will be on design, implementation, and management.
- 661. CURRENT THEORY AND PRACTICE IN THE TEACHING OF READING (4).** Pr., EED 652R or COL. Definition of reading; strategies for classroom management; cognitive, affective and psychomotor development as related to reading.
- 672. DESIGNING EARLY CHILDHOOD EDUCATION CURRICULA (4).** Pr., EED 621, EED 652A, one additional departmental curriculum and teaching course. Application of early childhood history, philosophy, and program analysis to the design of early childhood curriculum.
- 695. PRACTICUM. (1-15).** Provides experiences closely relating theory and practice, usually carried on simultaneously.
- 696. GRADUATE RESEARCH FORUM (1).**

The following research/field project credit options are available in each department according to the levels of degree study offered in the department.

- 699. RESEARCH AND THESIS (CREDIT TO BE ARRANGED).** May be taken more than one quarter.
- 798. FIELD PROJECT. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.
- 799. RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.

Engineering (EGR)

For other engineering courses, refer to individual departmental course offerings.

- 491. LEGAL ASPECTS OF ENGINEERING, ARCHITECTURE AND DESIGN (3).** Legal aspects of engineering and design; an introduction to the American legal system with emphasis on problems of the engineering and design professions.

English (EH)

Professors Allen, Amacher, Breyer, Jones, Littleton, Mowat, Nist, Woodall, and T. Wright

Associate Professors Hitchcock, Head, Brittin, Denton, Hudson, Jacobson, Jeffrey, Kouidis, Latimer, Morrow, Rose, Rygiel, Solomon, and Stroud

Assistant Professors Dunlop, R. Fenno, Gresham, Hammersmith, Nash, Rivers, St. John, Shields, and J. L. Waltman

Instructors Barrett, Brown, Corbin, C. Fenno, Giles, Himber, Howard, Jarecke, Likis, Lineberger, Loney, Nolan, Randolph, Rankin, Smith, Wade, J. A. Waltman, Wheeler, and R. Wright

The requirements for English and Comparative Literature majors enrolled in the School of Arts and Sciences are stated on page 85; requirements for English and Comparative Literature majors enrolled in the School of Education are stated on pages 120-121.

English Composition (101-102-103 or 105-106) is required of all students and is a prerequisite for all other courses in English.

I. General Curriculum Courses

- 100. **BASIC ENGLISH (NO CREDIT)**. All quarters. English grammar and mechanics and fundamentals of composition. Recommended for students with poor composition backgrounds or for students whose ACT or SAT verbal scores are low.
- 101-102-103. **ENGLISH COMPOSITION (3-3-3)**. EH 101 pr. for 102; 102 pr. for 103. All quarters. The essentials of composition and rhetoric. Reading of selected essays, fiction, poems, and plays.
- 105-106. **HONORS FRESHMAN ENGLISH (3-3)**. EH 105 pr. for 106. EH 105, Fall; 106, Winter. Reading and composition for superior students. Students earning a C or better final grade in both courses will receive an additional three hours of credit. The student who fails to earn at least a C changes to the regular sequence (EH 101-102-103) and completes a total of three courses. Departmental approval required for admission to this sequence.
- 141. **MEDICAL VOCABULARY (3)**. Fall, Winter, Spring. Prefixes, suffixes, and the more common root words of medical terminology.
- 250-251. **SURVEY OF ENGLISH LITERATURE FOR SUPERIOR STUDENTS (5-5)**. EH 250 rec. before 251. English literature from *Beowulf* to the present. An optional alternative to EH 253-254-255 for students with a B or better average in Freshman English.
- 253-254-255. **SURVEY OF ENGLISH LITERATURE (3-3-3)**. EH 253 rec. before 254, 254 rec. before 255. All quarters. English literature from *Beowulf* to the present.
- 260-261-262. **SURVEY OF LITERATURE OF THE WESTERN WORLD (3-3-3)**. All quarters. Master works from Homer to Faulkner: EH 260, the classical period; EH 261, medieval through eighteenth century; EH 262, nineteenth and twentieth centuries.

II. English Literature Before 1700

- 361. **HISTORY OF ENGLISH DRAMA (5)**. Winter. English drama from the medieval period to 1900.
- 362. **POETRY AND PROSE OF THE ENGLISH RENAISSANCE (5)**. Fall. Nondramatic literature, 1475-1640.
- 405. **CHAUCE (5)**. Winter. The major works of Chaucer in Middle English.
- 406. **MEDIEVAL ENGLISH LITERATURE (5)**. Spring. This course concentrates on *Le Morte d'Arthur*, *Sir Gawain and the Green Knight*, *Pearl*, medieval drama, and the Middle English lyric.
- 465. **THE AGE OF MILTON (5)**. Spring. Nondramatic literature of the seventeenth century, with emphasis on Milton.
- 498-499. **READINGS FOR HONORS (5-5)***. Pr., junior standing with a minimum of 3.0 overall average, a 3.5 average in at least five upper division English courses, and the consent of the English Department. Individual reading programs in a specific period or phase of literature or language, as determined by the instructor and student. An honors essay and a written examination will be required.
- 551-552. **SHAKESPEARE (5-5)**. EH 551-552, Fall; EH 552, Winter; EH 551, Spring. The first quarter deals with the plays written before 1600, emphasizing comedies and histories; the second, with the plays written after 1600, stressing tragedies. Credit for either or both of these courses precludes credit for EH 350.

III. English Literature After 1700

- 352. **CONTEMPORARY FICTION (5)**. Fall. American and British novelists from Lawrence to Faulkner.

363. **EIGHTEENTH-CENTURY BRITISH LITERATURE (5).** Winter. The Age of Dryden, Pope, and Swift.
375. **THE ENGLISH ROMANTIC MOVEMENT (5).** Spring. Romantic poetry from Gray to Keats.
463. **EIGHTEENTH-CENTURY ENGLISH LITERATURE (5).** Spring. Poetry and prose from Johnson through Blake.
550. **CONTEMPORARY POETRY (5).** Winter. The chief modern poets of England and America.
557. **VICTORIAN LITERATURE (5).** Winter. The major poets and nonfiction writers from 1830 to 1890.
- 581-582. **ENGLISH NOVEL (5-5).** EH 581, Fall; EH 582, Winter. The first course emphasizes the eighteenth-century novel; the second, the nineteenth-century novel.

IV. American Literature

325. **THE SHORT STORY (5).** Winter, Summer. The development of the short story in America and Europe from the early nineteenth century to the present.
- 357-358. **SURVEY OF AMERICAN LITERATURE (5-5).** The first course deals with American literature from the beginning to 1860; the second, with American literature from 1860 to the present.
472. **THE AMERICAN NOVEL (5).** Fall. The development of the American novel from the beginning to 1900.
591. **AMERICAN POETRY (5).** Fall, alternate years. Major American poets from the colonial period to the present.
592. **AMERICAN DRAMA (5).** Fall, alternate years. American dramatic and stage history from colonial times to the twentieth century, with emphasis on developing tastes and techniques.
595. **SOUTHERN LITERATURE (5).** Spring. The poetry, fiction, and nonfiction prose writings in the South from Revolutionary times to the present, with major emphasis centering on Southern regional attitudes and trends. EH 365 precludes credit for this course.

*May be taken in Categories II-VII.

V. Literature in Translation

312. **THE EUROPEAN NOVEL (5).** Spring. The reading and analysis of significant novels by major European writers.
335. **CLASSICAL MYTHOLOGY (3).** Winter. The character and influence of Greek and Roman mythology.
340. **THE CLASSICAL BACKGROUND (5).** Fall. Readings from the major Greek and Roman writers. The texts studied are chosen with particular attention to their subsequent influence upon English and American literature.
353. **CONTEMPORARY DRAMA (5).** Spring. Continental, British, and American dramatists from Ibsen to the present.
571. **RENAISSANCE AND BAROQUE (5).** Winter. A survey of the major trends in European literature from the fourteenth to the seventeenth centuries.
573. **ROMANTICISM (5).** Spring, alternate years. A comparative study of the major authors of the Romantic movement in Europe. The course's aim will be to distinguish national peculiarities and determine possibilities of a common thematic, stylistic ground.
574. **REALISM TO NATURALISM (5).** Spring, alternate years. A comparative study of major French, German, and Russian authors of Realism and Naturalism with a view to evolving novelistic techniques, subject matter, and philosophy.
575. **THE SYMBOLIST MOVEMENT IN LITERATURE (5).** Winter. A comparative study of Symbolism of the late nineteenth and early twentieth centuries.

VI. Language and Linguistics

391. **RHETORIC AND STYLISTICS (5).** Winter. The principles of rhetorical analysis and of modern stylistics with practical application of those principles to varied types of literary materials.
393. **INTRODUCTION TO LINGUISTICS (5).** Fall, Spring. A broad survey of the system and structure of modern American English (sounds, words, syntax, meaning) as well as developments in special areas of English linguistics, including the neurology and psychology of language, animal communication, and regional and social dialectology.
541. **HISTORY OF THE ENGLISH LANGUAGE (5).** Fall. The chronological development of the English language.
594. **MODERN ENGLISH GRAMMARS (5).** Winter, Spring. Modern methods of language study, with particular emphasis on English syntax and semantics.

VII. Writing Courses

- 301-302. **CREATIVE WRITING (3-3).** EH 301 pr. for 302. Fall, Spring. The writing and criticizing of short stories.
303. **CREATIVE WRITING (3).** Winter. The writing and criticizing of poems.
390. **ADVANCED COMPOSITION (5).** All quarters. The practice and theory of expository writing; the command of language for the clear and forceful communication of ideas.
530. **THE CRAFT OF FICTION (5).** Pr., EH 301-302, COI. Winter. The writing of fiction.

VIII. Courses on Special Topics

310. **WORD STUDY (3).** Fall. Both practical study of words to increase reading vocabulary and study of semantics (historical, literary, linguistic, general) to develop an analytical awareness of words and their uses.
350. **SHAKESPEARE'S GREATEST PLAYS (3).** Winter. Some of Shakespeare's masterpieces. Credit for EH 551-552 precludes credit for this course.
351. **SHAKESPEARE IN PERFORMANCE (3).** Spring. Some of Shakespeare's masterpieces; primary emphasis on the texts, but using also films and live actor presentations.
365. **SOUTHERN LITERATURE (3).** Spring.
373. **SCIENCE FICTION (3).** Winter. Representative science fiction from the nineteenth century to the present.
382. **POPULAR LITERATURE (3).** Spring. A study of various types of formula literature such as the detective story and the Western, and of the techniques of popular fictional writing.
383. **WOMEN IN ENGLISH AND AMERICAN LITERATURE (3).** Winter. Alternately, this course studies the stereotypes of women in literature and the achievement of women writers.
384. **THE AMERICAN DREAM (3).** Spring. The concept and sources of the American Dream and its influence on American literature from the discovery of America to the present.
385. **RECENT FICTION (3).** Alternates in Fall with EH 386. The reading and discussion of selected examples of the New Fiction.
386. **CONTEMPORARY PROSE (3).** Alternates in Fall with EH 385. Recent non-fiction prose works noteworthy for their style and content.
454. **SEMINAR IN LITERARY TOPICS (5).** Spring. Concentrated investigation of major figures in varying literary fields.

GRADUATE

610. **INTRODUCTION TO GRADUATE STUDY (5).** Fall.
- 611-612. **STUDIES IN THE HISTORY AND INTERPRETATION OF LITERATURE (5-5).** Summers only.
614. **THE THEORY OF PROSE FICTION (5).** Spring. Methods and techniques of prose fiction, particularly as they developed during the late nineteenth and early twentieth centuries. The course will focus on the close study of selected novels and criticism.
- 616-617. **STUDIES IN THE AMERICAN LANGUAGE (5-5).** Summers only.
620. **THE ENGLISH LANGUAGE I: OLD ENGLISH (5).** Winter.
621. **THE ENGLISH LANGUAGE II: MIDDLE AND MODERN ENGLISH TO 1500 (5).** Pri. EH 620 Winter.
623. **BEOWULF (5).** Pr., EH 620. Spring; alternate years.
625. **MEDIEVAL LITERATURE (5).** Fall.
626. **CHAUCE (5).** Spring.
627. **LINGUISTICS I: PHONOLOGY AND MORPHOLOGY (5).** Fall.
628. **LINGUISTICS II: SYNTAX AND GRAMMAR (5).** Winter; alternate years.
629. **LINGUISTICS III: FORMAL STYLISTICS (5).** Spring; alternate years.
631. **ELIZABETHAN AND JACOBAN DRAMA (5).** Fall.
632. **SPENSER (5).** Alternates in Spring with EH 636.
633. **STUDIES IN THE POETRY AND PROSE OF THE ENGLISH RENAISSANCE (5).** Alternates in Winter with EH 634.
634. **POETRY AND PROSE OF THE SEVENTEENTH CENTURY (5).** Alternates in Winter with EH 633.
635. **STUDIES IN SHAKESPEARE (5).** Spring.
636. **MILTON (5).** Alternates in Spring with EH 632.
640. **RESTORATION AND EIGHTEENTH-CENTURY ENGLISH DRAMA (5).** Spring.
641. **STUDIES IN THE AGE OF POPE (5).** Fall.
642. **STUDIES IN THE AGE OF JOHNSON (5).** Winter.
650. **STUDIES IN ENGLISH ROMANTICISM (5).** Winter.
652. **VICTORIAN POETRY (5).** Spring.
653. **VICTORIAN PROSE (5).** Fall.
654. **STUDIES IN THE NINETEENTH-CENTURY ENGLISH NOVEL (5).** Spring.

- 660. MODERN POETRY (5). Spring.
- 661. MODERN FICTION (5). Winter.
- 662. STUDIES IN TWENTIETH-CENTURY LITERATURE (5). Fall.
- 670. AMERICAN LITERATURE OF THE COLONIAL AND REVOLUTIONARY PERIODS (5). Spring.
- 671. STUDIES IN AMERICAN LITERATURE, 1800-1860 (5). Alternates in Winter with EH 673.
- 672. STUDIES IN AMERICAN LITERATURE, 1860-1914 (5). Fall.
- 673. STUDIES IN THE LITERATURE OF THE SOUTH (5). Alternates in Winter with EH 671.
- 680. THE HISTORY OF LITERARY CRITICISM (5). Alternates in Winter with EH 681.
- 681. THE HISTORY OF LITERARY CRITICISM (5). Continuation of EH 680. Alternates in Winter with EH 680.
- 684-685. DIRECTED INDIVIDUAL STUDY (5-5).
- 699. RESEARCH AND THESIS.
- 799. RESEARCH AND DISSERTATION.

English - Applied Writing (EHA)

- 304. TECHNICAL WRITING (3). All quarters. Practical writing, especially correspondence and reports, for students in scientific and technical fields. Credit for EH 315 precludes credit for this course.
- 307. CRIMINAL JUSTICE REPORT WRITING (3). Fall, Spring. Report and correspondence writing for students in criminal justice fields.
- 315. BUSINESS AND PROFESSIONAL REPORT WRITING (3). All quarters. The writing of formal and informal business reports with emphasis on design, organization, research, and presentation.
- 415. WRITTEN BUSINESS COMMUNICATIONS (3). All quarters. Application of semantics, communication theory, human relations, and rhetorical techniques to written business communications; practice in expository and persuasive writing.
- 416. APPLIED WRITING AND EDITING (3). Winter. An advanced course designed to develop skills in writing and editing documents common in business and industry; emphasis on preparing house organs, proposals, brochures, position papers, and annual reports.

Environmental Health (EHN)

For information on this program refer to the description of the curriculum in the Interdepartmental curricula section of the Bulletin.

Family and Child Development (FCD)

Professor M. L. Purcell, *Head*

Associate Professors Hinton, M. Layfield, B. Lindholm

Assistant Professors Bradbard, Britt, Halperin, and Tyson

Instructors Coker, Davies, Meadows, McLemore, and Wolters

- 157. FAMILY AND HUMAN DEVELOPMENT (3). All quarters. Human development as it is affected by the family and the family as it affects and is affected by the culture. Prior credit for any other Family and Child Development course precludes credit for this course. For majors only.
- 267. HUMAN DEVELOPMENT I: PRINCIPLES & THEORIES (4). Fall, Spring. Introduction to the principles and theories of human development.
- 269. FAMILY I: MATE SELECTION AND MARITAL INTERACTION (4). All quarters. Analysis of courtship, mate selection, and marital interaction. Factors contributing to marital stability and success.
- 270. FAMILY II: STRUCTURE AND FUNCTION OF THE FAMILY (4). Pr., SY 201. All quarters. Introduction to the structure and function of the family, its interaction with other societal institutions, and the effects on all family members.
- 280. HUMAN DEVELOPMENT II: INFANCY (4). Pr., FCD 267 or COI. Winter. Intensive study of physical, cognitive, and psycho-social aspects of development from conception to age two. Lab. experiences may be arranged.
- 300. APPROACHES TO CHILD STUDY (4). LEC. 3, LAB. 2. Pr., FCD 267, 270. Fall, Winter, Spring. Principles and techniques of studying children and their families. Directed observation experiences are arranged in the Child Study Center.
- 301. HUMAN DEVELOPMENT III: EARLY AND MIDDLE CHILDHOOD DEVELOPMENT (5). LEC. 4, LAB. 2. Pr., FCD 267 or 270. All quarters. Physical, intellectual, social, and emotional development of children from early through middle childhood; familial influences on development and behavior. Laboratory experiences are required.

- 302. HUMAN DEVELOPMENT IV: ADOLESCENCE AND EARLY ADULTHOOD (4).** Pr., FCD 267, 270, and junior standing. Fall, Spring. A study of the individual from adolescence through early adulthood, emphasizing familial influence on development and behavior. Field assignments are required.
- 306. FAMILY III: PATTERNS OF FAMILY INTERACTION (4).** Pr., FCD 270. Fall, Spring. Current theories of family interaction including normal and deviant patterns and other effects.
- 308. THE FAMILY AND CHILD MENTAL HEALTH (4).** Pr., FCD 267, 270. Winter, Summer. Impact of the family on children's emotional development.
- 310. TECHNIQUES OF INTERVIEWING (4).** Pr., COI, or submission of initial application for internship. Fall, Spring. Principles and techniques of interviewing and establishing a helping relationship with individuals and groups.
- 330. LIFESPAN HUMAN DEVELOPMENT (5).** Pr., FCD 157, or 270 or PG 211 or SY 301 or COI. Spring. A survey of the basic theories and empirical data related to the process of human development from conception to death, with focus on practical implications. Laboratory experiences required. This course is designed primarily for Nursing and Vocational Home Economics students. Not open to FCD majors.
- 347. LABORATORY EXPERIENCES WITH YOUNG CHILDREN (3). LEC. 1, LAB. 6.** Pr., FCD 267, 270, 300, 301. Fall, Winter, Spring. Substantive lecture material and supervised participation in the Child Study Center preschool programs. (Required of all FCD and FCS majors.)
- 350. DAY CARE FOR CHILDREN (4).** Pr., FCD 267, 301, junior standing, or COI. Winter. An historical and theoretical study of day care with discussion of multi-cultural programs, licensing standards, and various patterns of group and family day care service. Field assignment required.
- 358. LEARNING EXPERIENCES FOR YOUNG CHILDREN (4). LEC. 4.** Pr., FCD 267, 270, 300. Fall-Spring. Methods of promoting cognitive, social, emotional and physical development of young children. To be taken before FCD 359.
- 359. PRACTICUM IN PRESCHOOL TEACHING (3). LEC. 1, LAB. 6.** Pr., FCD 358. Fall, Winter, Spring. Laboratory experiences in the Child Study Center implementing methods and materials taught in FCD 358.
- 399. EXPERIENTIAL LEARNING (1-6) TBA.** COI. Independent work experience arranged. A. Project Uplift; B. Child Study Center; C. Other approved placements. May be taken more than once. Total credit not to exceed 6 hours.
- 409. UNDERGRADUATE RESEARCH AND STUDY. CREDIT TO BE ARRANGED (1-5).** May be repeated for a maximum of 5 credits. Pr., departmental approval of written application. All quarters. Consent for enrollment is based on a written proposal outlining the proposed course of study. Students should consult the department head for further information and approval forms.
- 410. DIRECTED READING IN FAMILY AND CHILD DEVELOPMENT. CREDIT TO BE ARRANGED (1-3).** Pr., COI. All quarters. May be repeated for a maximum of 3 credits.
- 420. RECENT RESEARCH IN CHILD DEVELOPMENT (4).** Pr., FCD 267, 270. Winter, Summer. Synthesis of recent research in child development with particular emphasis on studies dealing with family influences on children.
- 438. STUDY/TRAVEL IN FAMILY AND CHILD DEVELOPMENT (2-8).** Pr., junior standing and COI. Course may be repeated for a maximum of 12 undergraduate credits or 8 graduate credits. Concentrated study of family and child development in foreign locations aimed at greater understanding of the dynamics of child development and patterns of family life. Lectures presented at prearranged points. Papers required on selected phases of the course.
- 467. PARENT EDUCATION (4).** Pr., FCD 270. All quarters. The principles of working with parents on both an individual and group basis. Laboratory experiences may be arranged.
- 477. HUMAN DEVELOPMENT V: FAMILY AND AGING (3).** Pr., FCD 270. Spring. The interactive nature of the aging process as it relates to the family and its older members with emphasis upon the problems of health, finances, housing, and leisure time. Laboratory experiences provided.
- 487. INTRODUCTION TO FIELD EXPERIENCES AND CAREERS (2).** Pr., majors only and junior standing. Fall, Winter, Spring. Introductory course designed to help students prepare for supervised professional experiences and to plan for entering careers related to Family and Child Development.
- 497. DIRECTED FIELD EXPERIENCE (5-15 HOURS IN A, B, C, D, E, OR F).** Pr. 487. No more than three (3) options may be taken for a total of twenty (20) credits. A. Social Services; B. Family and Child Development; C. Maternal and Child Health; D. Day Care; E. Parent Education; F. Aged. Field experience arranged on individual basis, supervised by faculty in community agencies, hospitals, clinics, Child Study and Family Life Centers.
- 499. SEMINAR (2).** Pr., FCD 497 or COI.

ADVANCED UNDERGRADUATE AND GRADUATE

- 547. ADMINISTRATION OF PROGRAMS FOR YOUNG CHILDREN (3).** Pr., FCD 358 or COI, senior standing. Spring. Essential procedures in programming for young children, including housing, equipment, financing, staff, records, feeding, health protection, and community relations. Field trips are arranged to selected children's centers.
- 568. WOMEN'S CHANGING ROLES AND POTENTIALITIES (3).** A critical analysis of women's changing roles in society. Effects of these changes on the family and on women's self-fulfillment and social contributions.
- GRADUATE**
- 605. METHODS OF RESEARCH IN HOME ECONOMICS (3).** Pr., PG 215 or equivalent. Winter, Summer. Research and investigation methods applicable to the various areas of Home Economics. Required of all graduate students in Family and Child Development.
- 609. SPECIAL PROBLEMS (1-5).** Pr., COI, and approval of written application by major professor. May be taken for more than one quarter. Not to exceed 5 hours of credit toward the minimum of 48 for the M.S. degree. All quarters. A. Family Relations; B. Child Development; C. Marriage and Family Counseling; D. Parent Education.

810. **PERSONALITY DEVELOPMENT (4).** Pr., FCD 267 or equivalent. Fall. The development of personality of the child with particular emphasis on the effects of family interaction in the early years.
611. **ADVANCED CHILD DEVELOPMENT (4).** Pr., FCD 610 or PG 533 or COI. Winter, Summer. Advanced study of theoretical and empirical material regarding child development from conception through adolescence, with emphasis on physical and cognitive development.
616. **SOCIAL DEVELOPMENT OF CHILDREN (4).** Pr., FCD 611 or COI. Spring. Theory and research related to the acquisition of social behavior by children.
618. **DAY CARE AND THE FAMILY: RESEARCH AND ISSUES (4).** Pr., FCD 611 or COI. Winter. Research and issues concerning the impact of day care on the family unit and children's social, emotional, and cognitive development.
620. **THE FAMILY AND ITS RELATIONSHIPS (4).** Pr., SY 301. FCD 270, 610 or PG 433, or COI. Fall. Intensive study of the family and its effect on personality development.
621. **PARENT-CHILD RELATIONS (4).** Pr., FCD 270, 610 or COI. Fall. Discussion of parent-child relations and evaluation of relevant research literature.
622. **FAMILY PSYCHOPATHOLOGY (4).** Pr., FCD 620 and PG 535. Winter. Dynamics of psychopathology in families and critical evaluation of current theory and research.
623. **RESEARCH METHODS FOR CHILD AND FAMILY STUDY (4).** Pr., FCD 610 or COI. Winter. Survey of principles and methods for the study of children and their families.
624. **MARRIAGE AND FAMILY COUNSELING (4).** Pr., FCD 610, 620, and 622; CED 628 or PG 638. Spring. Discussion of individual, conjoint, and group techniques of marriage and family counseling.
625. **HUMAN SEXUAL BEHAVIOR (4).** Pr., FCD 610 and 620. Pr., or coreq., FCD 622. Nature of sexual development, normal and abnormal sexual functioning, attitudes toward sex. Treatment of sexual dysfunction.
628. **PARENTAL EDUCATION (4).** Pr., SC 273, FCD 610, 611, and 620 or COI. Summer. Parent education, its scope, aims, and effects on parent-child relationships.
629. **READINGS IN FAMILY LIFE AND CHILD DEVELOPMENT (4).** Pr., FCD 267, 270 or COI. All quarters. Current literature and research concerning the pre-school child; the school-age child; the adolescent; the young adult: problems of later maturity; changing family patterns.
637. **PROFESSIONAL ISSUES IN FAMILY AND CHILD DEVELOPMENT (2).** Pr., FCD 625. Spring. History of professionalization. Role and function of professional associations and organizations, with professional licensure, ethics, and issues of private practice discussed.
660. **SEMINAR (1-5).** A. Family Relations; B. Child Development; C. Research Techniques; D. Marriage and Family Counseling; E. Parent Education.
662. **PRACTICUM (2-12).** All sections except E may be repeated for a maximum of 8 hours of credit. Section E may be repeated for a maximum of 12 hours of credit. Pr., departmental approval. All quarters. A. Child Development; B. Family Relations; C. Parent Education; D. Day Care and Programs for Young Children; E. Marriage and Family Counseling.
899. **RESEARCH AND THESIS. CREDIT TO BE ARRANGED.** All quarters. Required of all students under the Thesis Option in any field.

Fisheries and Allied Aquacultures (FAA)

Professors Shell, Head, Boyd, Lawrence, Lovell, Moss, Rogers, and
Smitherman

Associate Professors Allison, Bayne, Davies, Grover, Plumb, Ramsey,
Schmittou, Shelton, and Snow

Assistant Professors Grizzle and Malvestuto

Research Associates Goodman and Hollerman

201. **COMMERCIAL MARINE FISHERIES OF ALABAMA (3).** Exploitation and biology of commercial vertebrates and invertebrates of Alabama and the adjoining Gulf of Mexico, with emphasis on distribution, harvesting technology, processing, and economic values. Laboratory exercises include visits to local processing plants, and a trawling expedition aboard the R/VG.A. Rounsefell. Staff. Taught only at Dauphin Island Sea Lab.
312. **PRACTICAL FISH CULTURE (5). AS ARRANGED.** Credit will be arranged for 3 months in a state or federal hatchery or in an approved commercial hatchery or on other phases of fish culture. All students wishing to take this course must obtain permission to do so from the Head of the Department.
498. **SPECIAL PROBLEMS IN FISHERIES AND AQUACULTURES (1-3).** Pr., senior standing. A student can register for a total of not more than three hours credit.

ADVANCED UNDERGRADUATE AND GRADUATE

510. **ORGANIZATION, PROGRAMMING AND IMPLEMENTATION OF AQUACULTURAL EXTENSION (5). LEC. 3, LAB. 6.** Pr., AEC 202 or equivalent. Spring. Concepts and practices pertaining to aquacultural extension organization, administration, program development and implementation in the U.S. and developing countries.
515. **LIMNOLOGY (5). LEC. 3, LAB. 6.** Pr., CH 104, PS 205, BI 103. Spring. Biological, chemical, and physical factors affecting aquatic life.
516. **BIOLOGICAL PRODUCTIVITY AND WATER QUALITY (5). LEC. 5.** Pr., CH 208 or COI. Fall. Chemical and biological aspects of water quality as related to fisheries and aquaculture.

- 517. ADVANCED BIOLOGICAL PRODUCTIVITY AND WATER QUALITY (5). LEC. 3, LAB. 6.** Pr., FAA 516 or COL. Winter. Advanced water quality studies related to fisheries and aquaculture. Emphasis on measurement of relevant water quality parameters and interpretation of data.
- 518. FISH BREEDING (3). LEC. 3.** Pr., ZY 300. Fall. Philosophy of breeding in fishes and other aquatic animals; principles and methods in fish breeding; inheritance of characters responsible for efficient fish production.
- 519. AQUACULTURE (5).** Pr., ZY 501, FAA or ZY 538. Summer. A lecture, laboratory, and field course introduces aquatic and marine biology students to the history, principles, problems, and procedures relating to the culture of commercially important crustaceans, fish, and mollusks along the Gulf coast. Offered only at the Gulf Coast Research Laboratory, Ocean Springs, Mississippi.
- 520-521-522. FISH PRODUCTION (2-2-2). LEC. 1-1-1, LAB. 4-4-4.** Pr., FAA 516 and junior standing. Spring, summer, fall. Practical problems involved in the breeding, feeding, health, management, processing and marketing of fish for economic production.
- 528. HATCHERY MANAGEMENT FOR SPORT FISH (5). LEC. 3, LAB. 4.** Pr., BI 103. Spring. Operation of hatcheries for production of cold- and warm-water game fish and bait minnows; care of brood fish; methods of stocking, fertilizing, supplementary feeding, and controlling weeds; transportation of fish; control of parasites; and related hatchery problems.
- 529. HATCHERY MANAGEMENT FOR FOOD FISH (5). LEC. 3, LAB. 6.** Pr., BI 103 and FAA 528. Summer. Operation of hatcheries to produce seed stock of the most important species of food finfish. Emphasis on spawning, hatching, rearing, harvesting and distribution.
- 530. POND CONSTRUCTION (5). LEC. 1, LAB. 8.** Fall. Principles and practice in the selection of pond surveying and mapping pond areas, and construction of dams, spillways and diversion ditches.
- 535. MANAGEMENT OF AQUATIC FLORA IN FISHERIES AND AQUACULTURE (5). LEC. 3, LAB. 6.** Pr., or Coreq., BY 506 or equivalent and COL. Summer. The role of aquatic vegetation in fish production, its utilization and control.
- 536. MANAGEMENT OF SMALL IMPOUNDMENTS (5). LEC. 3, LAB. 6.** Pr., BI 103. Summer. Consideration of the species of fish used in management of small impoundments, species balance, population balance analysis, methods of correcting unbalanced conditions, renovation of old impoundments, and related problems of water management.
- 537. FISHERIES BIOLOGY (3).** Pr., BI 103. Winter. An introduction to the study of vital statistics of fish populations.
- 538. GENERAL ICHTHYOLOGY (5). LEC. 3, LAB. 6.** Pr., BI 103. Fall. Survey of functional morphology, classification, and distribution of fishes. Introduction of faunistic literature of North America and the world. Identification of fishes from the Gulf of Mexico and North American fresh waters.
- 539. FISHERIES BIOLOGY LABORATORY (2). LAB. 6.** Pr., FAA 537 or COL. Winter. Laboratory exercises in sampling (bias, precision, accuracy), population estimation, age and growth, mortality and population dynamics models.
- 544. MORPHOLOGY OF FISH (5). LEC. 3, LAB. 6.** Pr., BI 103, COL. Summer. Gross and microanatomical studies of principal fish groups.
- 545. FISH PARASITOLOGY (5). LEC. 3, LAB. 6.** Pr., BI 103. Fall. Basic concepts of fish parasitology and epizootiology, identification and control of fish parasites.
- 546. FISH DISEASES (5). LEC. 3, LAB. 6.** Pr., BY 300. Spring. Bacterial and viral diseases of fishes, their isolation, culture identification, and control.
- 547. MANAGEMENT OF STREAMS AND LARGE IMPOUNDMENTS (3). LEC. 3.** Pr., FAA 537, or COL. Fall. Fish populations of streams and large impoundments and a consideration of methods for managing those populations.
- 548. SAMPLING FISH POPULATIONS (1). LAB. 4.** Pr., or Coreq., FAA 547 or COL. Fall. Theory, equipment, and procedures for sampling fish populations.

GRADUATE

- 615. ADVANCED FISHERIES BIOLOGY (3). LEC. 3.** Pr., FAA 539. Spring. Gear selectivity and sampling designs. Interpretation of quantitative data on fish populations. Application of yield models to assessment and management of fish stocks.
- 616. SYSTEMATIC ICHTHYOLOGY (3). LEC. 1, LAB. 6.** Pr., ZY 538 or FAA 538. Winter odd years. Fishes of the world: their morphology, distribution and use to man. The course emphasizes individual work with world faunistic literature, revisions and museum materials.
- 617. QUANTITATIVE TECHNIQUES IN FISHERIES BIOLOGY (3). LAB. 6.** Pr., FAA 539, BY 216 or equivalent or COL. Spring. Analysis of fisheries data using the computer. Application of the Statistical Analysis System (SAS) will be stressed.
- 618. AQUACULTURE (5).** Pr., FAA 516. Winter. Principles underlying aquatic productivity and levels of management as demonstrated by domestic and foreign lotic and lenitic cultures of fish and other aquatic crops.
- 620. FISH PROCESSING TECHNOLOGY (5). LEC. 3, LAB. 6.** Pr., CH 208 and BY 300 or ADS 514. Winter. Chemical and biological aspects of fishery products as they are related to the use of these products for human foods; principles of preservation; unit operations in processing; packaging, storage, and distribution.
- 621. FISH NUTRITION (5). LEC. 3, LAB. 6.** Pr., CH 208 and course in physiology or nutrition or COL. Summer. Fundamental and applied aspects of fish nutrition including the physiology of food assimilation, nutrient requirements, nutrient chemistry of feed sources, ration formulation and practical feeding.
- 624. WATER QUALITY MANAGEMENT IN AQUACULTURE (5). LEC. 5.** Pr., FAA 516, 617, or COL. Spring. Chemical, mechanical, and biological methods for maintaining and improving water quality in fish culture.

826. **WATER UTILIZATION IN AQUACULTURE (5).** LEC. 5. Pr., FAA 516. Winter. Climatic, geologic, hydrologic, economic and hydraulic factors influencing the utilization of water for aquaculture.
645. **ADVANCED FISH PARASITOLOGY (3).** LEC. 1, LAB. 6. Pr., FAA 545. Winter. The morphology, taxonomy, life history, ecology and pathological effects of parasites of fish.
646. **ADVANCED MICROBIAL FISH DISEASES (3).** LEC. 1, LAB. 6. Pr., FAA 546 or COI. Fall. Advanced study of the epizootiology, pathogenesis, isolation, taxonomy and immunology of bacterial and viral diseases of fish.
647. **CLINICAL FISH DISEASE DIAGNOSIS (1-3).** Pr., 544, 545, 546 or COI. Any quarter by arrangement. Clinical diagnosis of fish diseases; necropsy of diseased fish and formulating corrective measures for diseased condition. May be repeated for a maximum of 6 hours credit.
649. **FISH PATHOLOGY (3).** LEC. 2, LAB. 3. Pr., FAA 544, 546. Spring. Structural and functional changes produced by fish diseases.
693. **SEMINAR (1).** LEC. 1, Fall, Winter.
698. **SPECIAL PROBLEMS IN FISHERIES AND ALLIED AQUACULTURES (2-5).** A. Aquaculture; B. Aquatic Ecology; C. Biology and Management; D. Ichthyology; E. Nutrition; F. Pathology; G. Processing and Technology; H. Water Quality; I. Technology Transfer; J. Computer Applications.
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)**
799. **DOCTORAL RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)**

Food Science (FS)

Professors Cannon, *Chairman*, Huffman, and Lovell
Associate Professors M. F. Chastain, Flood, McCaskey, and Rymal
Assistant Professor D. A. Smith

The Food Science curriculum is administered by the Department of Animal & Dairy Sciences.

201. **INTRODUCTORY FOOD SCIENCE AND TECHNOLOGY (5).** LEC. 4, LAB. 2. Fall. Principles of major food processing methods, concepts of food quality, nutrition, sanitation, packaging, food safety, and food laws pertinent to wholesome, safe food production. (Same course as ADS 201.)
260. **GROWTH AND BODY COMPOSITION (4).** LEC. 2, LAB. 4. Winter, Spring. Prenatal and postnatal growth of muscle, fat, and bone of meat animals; the evaluation of body composition, quality, and yield grading; the pricing of live animals and their carcasses. (Same course as ADS 260.)
331. **MEAT SELECTION AND GRADING (3).** LEC. 1, LAB. 4. Spring. The development of grading standards and application of federal grades to lamb, pork and beef carcasses, comparative evaluation of carcasses and wholesale cuts. Some labs in nearby processing plants. (Same course as ADS 331.)
340. **INDUSTRIAL FOOD PRESERVATION TECHNOLOGY (5).** LEC. 3, LAB. 4. Pr., COI or junior standing. Fall, odd years. Principles of food preservation as applied to industry. Processes considered including refrigeration, pasteurization, canning, freezing, drying, concentration, fermentation, pickling, salting, irradiation, and the use of food additives. (Same course as HF 340.)
355. **FOOD ENGINEERING (5).** Fall. Pr., MH 161, PS 205. Engineering concepts and unit operations used in processing and handling of food products. (Same course as AN 355.)
370. **MEAT SCIENCE (5).** LEC. 4, LAB. 3. Fall, Winter. Fundamentals of slaughter, processing, storage and merchandising of meat and meat products. Biochemical and physiological implications of nutrition, breeding and antemortem treatment on meat quality, curing and processing. (Same course as ADS 370.)
375. **FUNDAMENTALS OF DAIRY PROCESSING (5).** LEC. 3, LAB. 4. Winter. Physical and chemical characteristics of milk. Milk quality. Basic processing technology. (Same course as ADS 375.)
429. **FOOD SCIENCE SEMINAR (1).** Pr., senior standing. Winter. Lectures, demonstrations and literature reviews by staff, students, and guest lecturers. (Same course as HF 429.)
543. **FOOD CHEMISTRY (5).** LEC. 3, LAB. 4. Pr., CH 207. Winter. The chemistry of the important components of foods and changes occurring during processing, storage and handling. (Same course as HF 543.)
545. **FOOD ANALYSIS AND QUALITY CONTROL (5).** LEC. 3, LAB. 4. Pr., HF 543. Spring. Sensory, chemical, and instrumental food analysis and its application to quality control and evaluation of grades and standards. (Same course as HF 545.)
570. **ADVANCED MEAT SCIENCE AND MUSCLE BIOLOGY (5).** LEC. 3, LAB. 4. Pr., ADS 370 or equivalent. Spring. Physiology and biochemistry of muscle and its conversion to meat; mechanism of muscle contraction; muscle microanatomy, antemortem and postmortem factors influencing fresh meat composition and quality. (Same course as ADS 570.)
575. **ADVANCED DAIRY PROCESSING (4).** LEC. 3, LAB. 3. Pr., ADS 375 or COI. Spring. Specialized techniques in the processing of different types of dairy products; automation in the dairy plant; quality assurance program. (Same course as ADS 575.)
577. **FOOD PLANT SANITATION (4).** LEC. 3, LAB. 2. Pr., BY 300 or COI. Winter. Sanitary regulation of food plants. Hazards in the food system and their elimination. Quality assurance. (Same course as ADS 577.)
579. **FOOD MICROBIOLOGY (5).** LEC. 3, LAB. 4. Spring. Relationship of habitat to the occurrence of microorganisms on food; environment affecting the growth of various microorganisms in food; microbiological action in food spoilage and food manufacture; physical, chemical and biological destruction of microorganisms in foods; microbiological examination of foodstuffs; and public health and sanitation microbiology. (Same course as ADS 579.)

Foreign Languages (FL)

Professors DiOrio, and Peak

Associate Professors Helmke, Henkels, Head, Madrigal, Perricone Phillips, Posniak, Spencer, and Warbington

Assistant Professors Glaze, Latimer, Morris, Rivas, and Wolverton

Instructors Cox, Elmore, Millman, and Vandegrift

It is to the student's advantage to begin foreign language at the highest possible level because by so doing he can gain college credits through advanced placement. On the basis of the Foreign Language Department's evaluation of his previous foreign language training and/or test scores, he may enter the second, third, or fourth quarter course in a language. If he makes a grade of C or higher, he will receive 10, 15, or 20 hours, respectively (5 credit hours for the course and 5, 10, or 15 hours, respectively, for advanced placement). If the student is well enough prepared, he may enter at a level higher than the fourth quarter, but he will not receive more than 15 hours through advanced placement.

If he does not earn at least a C, he will not be granted advanced placement credit. He may then enter the language at a lower level, re-enter at the same level, or attempt another approved language.

Credits earned through advanced placement may be applied toward graduation as well as toward foreign language requirements in various curricula.

While eligible for advanced placement as indicated above, students who are native speakers in a foreign language may begin courses in that language only at the 300-level or higher—excluding conversation courses altogether—if they have received substantial academic preparation in that same language (such as the French *Baccalauréat*, the German *Abitur*, the Spanish *Bachillerado*, or higher).

Students who are either foreign or U.S. ethnic native speakers in a foreign language, but with minimal or limited academic preparation therein, may begin courses in that language only at the 200-level or higher. If special situations arise, such as foreign language learning through extensive residence abroad, the adviser for the specific language involved will make an appropriate entry level determination, within the framework of these guidelines, upon request of the instructor in whose class the student is enrolled.

Language Proficiency Courses

090. **PROFICIENCY IN ENGLISH FOR FOREIGN STUDENTS. NO CREDIT.** Individualized and small group instruction primarily for foreign graduate students who need to obtain greater proficiency in comprehension and in spoken and written English, including idiomatic expressions and cultural adaptation. May be repeated.
- 127-128. **READING PROFICIENCY IN FRENCH. NO CREDIT. LEC. 3.** Pr. for FL 128, departmental consent. Winter and Spring. Primarily for graduate students who should consult their advisers for specific departmental language requirements. FL 128 channels students into their field of study, e.g., humanities, social sciences, and sciences.
- 137-138. **READING PROFICIENCY IN SPANISH. NO CREDIT. LEC. 3.** Pr. for FL 138, departmental consent. Winter and Spring. Primarily for graduate students who should consult their advisers for specific departmental language requirements. FL 138 channels students into their field of study, e.g., humanities, social sciences, and sciences.
- 157-158. **READING PROFICIENCY IN GERMAN. NO CREDIT. LEC. 3.** Pr. for FL 158, departmental consent. Winter and Spring. Primarily for graduate students who should consult their advisers for specific departmental language requirements. FL 158 channels students into their fields of study, e.g., humanities, social sciences, and sciences.
- 177-178. **READING PROFICIENCY IN RUSSIAN. NO CREDIT. LEC. 3.** Pr. for FL 178, departmental consent. Winter and Spring. Primarily for graduate students who should consult their advisers for specific departmental language requirements. FL 178 channels students into their field of study, e.g., humanities, social sciences, and sciences.
391. **LYRIC DICTION PROFICIENCY IN FRENCH, GERMAN, ITALIAN. (3).** Winter. Stress on phonetics and prosody. Primarily for undergraduate students in music seeking technical control of lyric diction and prosody in French, German, and Italian. May be used for foreign language students for elective credit only. This course does not substitute for the three quarters of foreign language required for the Bachelor of Music degree. May be repeated without credit.

Latin

111-112-113. FIRST YEAR LATIN I-II-III (5-5-5). FL 111 pr. for 112; FL 112 pr. for 113. Fundamentals of Latin; language skills stressed with increasing emphasis on reading, including selections from ancient authors.

211-212-213. SECOND YEAR LATIN I-II-III (5-5-5). Pr., FL 113 or equivalent. FL 211 pr. for 212; FL 212 pr. for 213. Exceptions to this sequence may be granted by departmental consent or when course offerings so require. Review of Latin grammar and syntax and survey of Latin literature through selected readings of authors primarily from the Golden and Silver Ages, 80 B.C.—ca. 140 A.D.

French

121-122-123. FIRST YEAR FRENCH I-II-III (5-5-5). FL 121 pr. for 122; FL 122 pr. for 123. Fundamentals of French; language skills stressed with progressive emphasis on conversation. Exposure to French civilization.

220. READINGS IN FRENCH NEWSPAPERS AND MAGAZINES (3). Pr., FL 123 or equivalent. Practice in reading comprehension in French to maintain and upgrade proficiency. Texts chosen from selected French publications with emphasis on contemporary culture (French life, politics, customs, social institutions, etc.) Grammar is covered as an aid to reading, and discussions of texts are conducted in English. May not be counted toward a major or minor.

221-222-223. SECOND YEAR FRENCH I-II-III (5-5-5). Pr., FL 123 or equivalent. FL 221 pr. for 222; FL 222 pr. for 223. Exceptions to this sequence may be granted by departmental consent or when course offerings so require. Language skills stressed; structural review and composition; reading in French literature; exposure to French civilization.

321. FRENCH CONVERSATION (3 OR 5'). Pr., FL 223 or equivalent. Fall. Practice in spoken, everyday French, based on texts and situations concerning contemporary life especially in France. May be repeated once for credit but counted only once toward a major.

322. FRENCH COMPOSITION (3 OR 5'). Pr., FL 223 or equivalent. Winter. Practice in writing letters, brief articles, themes and reports, based on original composition and on translation. May be repeated once for credit but counted only once toward a major.

323. FRENCH CIVILIZATION (3 OR 5'). Pr., FL 223 or equivalent. Spring. Consideration of topical aspects of the cultural heritage of France, as reflected in present day life patterns, traditions and institutions.

324. SURVEY OF FRENCH LITERATURE I (3 OR 5'). Pr., FL 223 or equivalent. Fall. Readings in French literature from the Middle Ages through the seventeenth century.

325. SURVEY OF FRENCH LITERATURE II (3 OR 5'). Pr., FL 223 or equivalent. Winter. Readings in French literature from the eighteenth and the early nineteenth centuries.

326. SURVEY OF FRENCH LITERATURE III (3 OR 5'). Pr., FL 223 or equivalent. Spring. Readings in French literature from the latter nineteenth and the twentieth centuries.

327. SEMINAR IN FRENCH LITERATURE AND/OR LANGUAGE SKILLS (3 OR 5'). Pr., FL 223 or equivalent. Summer. Readings in French literature from selected periods and/or practice in writing and speaking French. May be repeated once for credit but counted only once toward a major.

329. BUSINESS FRENCH (3). Pr., FL 223 or equivalent. Intensive practice in preparing commercial correspondence and reading contracts, agreements, and related documents in French. Emphasis will be placed on the acquisition of a business-oriented vocabulary.

427. INDEPENDENT WORK IN FRENCH (3 OR 5'). Pr., four 300-level French courses or equivalent. Directed study in area of special interest, for the superior student in French. May be repeated once for credit.

428. FRENCH CONTINUING CONVERSATION (1). Pr., FL 321 and FL 322, or equivalent. Continuing practice in spoken French to maintain and upgrade proficiency while completing other requirements for graduation. May not be counted toward a major, but may be repeated once for credit.

429. FRENCH CONTINUING COMPOSITION (1). Pr., FL 321 and FL 322, or equivalent. Continuing practice in written French to maintain and upgrade proficiency while completing other requirements for graduation. May not be counted toward a major, but may be repeated once for credit.

Spanish

131-132-133. FIRST YEAR SPANISH I-II-III (5-5-5). FL 131 pr. for 132; FL 132 pr. for 133. Fundamentals of Spanish. Language skills stressed with progressive emphasis on conversation. Exposure to Hispanic civilization.

231-232-233. SECOND YEAR SPANISH I-II-III (5-5-5). Pr., FL 133 or equivalent. FL 231 pr. for 232; FL 232 pr. for 233. Exceptions to this sequence may be granted by departmental consent or when course offerings so require. Language skills stressed; structural review and composition; reading in Spanish literature; exposure to Hispanic civilization.

331. SPANISH CONVERSATION (3 OR 5'). Pr., FL 233 or equivalent. Fall. Intensive practice in the spoken language, with simultaneous review of vocabulary and structure. May be repeated once for credit but counted only once toward a major.

*300 and 500-level French and Spanish courses will carry 5 quarter hours of credit only when taken in the Alabama-Auburn Academic Summer Abroad Program.

332. **SPANISH COMPOSITION (3 OR 5').** Pr., FL 233 or equivalent. Winter. Practice in writing letters, brief articles, themes and reports, based on original composition and translation. May be repeated once for credit but counted only once toward a major.
333. **SPANISH CIVILIZATION (3 OR 5').** Pr., FL 233 or equivalent. Alternate Spring. Intensive exposure to the culture of Spain, as reflected in the fine arts and literature. Emphasis on geographic, historical, social, artistic, spiritual, and political forces in Spanish civilization and its contribution to world cultures.
334. **SURVEY OF SPANISH LITERATURE TO 1700 (3 OR 5').** Pr., FL 233 or equivalent. Fall. Development of Spanish literature from its beginnings through the Golden Age (1700).
335. **SURVEY OF SPANISH LITERATURE FROM 1700 (3 OR 5').** Pr., FL 233 or equivalent. Winter. Development of Spanish literature from the Decadencia (1700) to the contemporary period.
336. **SURVEY OF SPANISH AMERICAN LITERATURE (3 OR 5').** Pr., FL 233 or equivalent. Spring. Panorama of literature in Spanish America from pre-Columbian times to present.
337. **SEMINAR IN ADVANCED COMPOSITION AND CONVERSATION (3 OR 5').** Pr., FL 233 or equivalent. Summer. Intensive practice in composition and conversation through original and directed themes as well as through oral presentations. May be repeated once for credit.
338. **SPANISH-AMERICAN CIVILIZATION (3 OR 5').** Pr., FL 233 or equivalent. Alternate Spring. Intensive exposure to the culture of Spanish America, as reflected in the fine arts and literature. Emphasis on geographic, historical, social, artistic, spiritual, and political forces in Spanish-American civilization and its contribution to world cultures.
339. **BUSINESS SPANISH (3).** Pr., FL 233 or equivalent. Intensive practice in preparing commercial correspondence and reading contracts, agreements, and related documents in Spanish. Emphasis will be placed on the acquisition of a business-oriented vocabulary.
430. **SPANISH FOR INTERNATIONAL TRADE (3).** Pr., FL 339 or equivalent. Practice in handling, preparing and translating international trade correspondence and documents in Spanish. Development of case studies and other realistic international trade group work in Spanish and English, under simulated real-life pressures.
437. **SEMINAR IN HISPANIC LITERATURE (3 OR 5').** Pr., four 300-level Spanish courses or equivalent. Readings in Hispanic literature from selected genres, authors, periods, or movements. May be repeated once for credit.
438. **SPANISH CONTINUING CONVERSATION (1).** Pr., FL 331 and FL 332, or equivalent. Continuing practice in spoken Spanish to maintain and upgrade proficiency while completing other requirements for graduation. May be repeated once for credit.
439. **SPANISH CONTINUING COMPOSITION (1).** Pr., FL 331 and FL 332, or equivalent. Continuing practice in written Spanish to maintain and upgrade proficiency while completing other requirements for graduation. May be repeated once for credit, but counted only once toward a major.

Italian

- 141-142-143. **FIRST YEAR ITALIAN I-II-III (5-5-5).** FL 141 pr. to 142; 142 pr. to 143. Fundamentals of Italian. Language skills stressed, with progressive emphasis on conversation. Exposure to Italian civilization.
- 241-242-243. **SECOND YEAR ITALIAN I-II-III (5-5-5).** Pr., FL 143 or equivalent. FL 241 pr. to FL 242; FL 242 pr. to FL 243. (Exceptions to this sequence may be granted by departmental consent or when course offerings so require.) Stress on language skills; structural review and composition; readings in Italian literature and exposure to Italian civilization.

German

- 151-152-153. **FIRST YEAR GERMAN I-II-III (5-5-5).** FL 151 pr. to 152; 152 pr. to 153. Fundamentals of German. Stress on language skills, with progressive emphasis on conversation. Exposure to Germanic civilization.
- 251-252-253. **SECOND YEAR GERMAN I-II-III (5-5-5).** Pr., FL 153 or equivalent. FL 251 pr. to 252; 252 pr. to 253. Exceptions to the sequence may be granted by departmental consent or when course offerings so require. Stress on language skills; structural review and composition; readings in German literature and exposure to German civilization.
351. **GERMAN CONVERSATION (3).** Pr., FL 251 or equivalent. Fall. Practice in spoken, everyday German, based on texts and situations concerning contemporary life in Germany or other German-speaking countries.
352. **GERMAN COMPOSITION (3).** Pr., FL 251 or equivalent. Winter. Practice in writing letters, brief articles, themes and reports based on original composition and on translation.
353. **GERMAN CIVILIZATION (3).** Pr., FL 251 or equivalent. Spring. Review of the cultural heritage of the German language, with emphasis on its present-day status, influence and civilization in Germany and abroad.
354. **SURVEY OF GERMAN LITERATURE I (3).** Pr., FL 253 or any two German courses on the 300-level. Fall. Readings in German literature of the earliest periods to the eighteenth century.
355. **SURVEY OF GERMAN LITERATURE II (3).** Pr., FL 253 or any two German courses on the 300-level. Winter. Readings in German literature of the nineteenth century.
356. **SURVEY OF GERMAN LITERATURE III (3).** Pr., FL 253 or any two German courses on the 300-level. Spring. Readings in German literature of the twentieth century.

*300 and 500-level French and Spanish courses will carry 5 quarter hours of credit only when taken in the Alabama-Auburn Academic Summer Abroad Program.

357. **SEMINAR IN GERMAN LITERATURE (3).** Pr., FL 251 or equivalent. Summer. Readings in German literature from selected periods. Normally offered in Summer Quarter only.
359. **BUSINESS GERMAN (3).** Pr., FL 253 or equivalent. Intensive practice in preparing commercial correspondence and reading contracts, agreements, and related documents in German. Emphasis will be placed on the acquisition of a business-oriented vocabulary.
450. **GERMAN FOR INTERNATIONAL TRADE (3).** Pr., FL 359 or equivalent. Practice in handling, preparing and translating international trade correspondence and documents in German. Development of case studies and other realistic international trade group work in German and English, under simulated real-life pressures.
451. **GERMAN CLASSICISM (3).** Pr., four 300-level German courses or equivalent. Alternate Fall. Consideration, analysis, and criticism of German writing of the classical period.
452. **GERMAN ROMANTICISM (3).** Pr., four 300-level German courses or equivalent. Alternate Winter. Consideration, analysis, and criticism of German Romantic writing.
453. **GERMAN REALISM AND NATURALISM (3).** Pr., four 300-level German courses or equivalent. Alternate Spring. Consideration, analysis, and criticism of German writing of Realism and Naturalism.
454. **GERMAN DRAMA (3).** Pr., four 300-level German courses or equivalent. Alternate Fall. Consideration, analysis, and criticism of selected German theater.
455. **TWENTIETH-CENTURY GERMAN LITERATURE (3).** Pr., four 300-level German courses or equivalent. Consideration, analysis, and criticism of selected German prose prior to World War II.
456. **CONTEMPORARY GERMAN LITERATURE (3).** Pr., four 300-level German courses or equivalent. Consideration, analysis, and criticism of selected German writing since World War II.
457. **INDEPENDENT WORK IN GERMAN (3).** Pr., at least one 400-level German course and COI. Directed study in area of special interest for the superior student in German. May be repeated once for credit.
458. **GERMAN CONTINUING CONVERSATION (1).** Pr., four 300-level German courses, including FL 351 and FL 352, or equivalent. Continuing practice in spoken German to maintain and upgrade proficiency while completing other requirements for graduation. May be repeated once for credit, but counted only once toward a major.
459. **GERMAN CONTINUING COMPOSITION (1).** Pr., four 300-level German courses, including FL 351 and FL 352, or equivalent. Continuing practice in written German to maintain and upgrade proficiency while completing other requirements for graduation. May be repeated once for credit, but counted only once toward a major.

Portuguese

- 161-162-163. **FIRST YEAR PORTUGUESE I-II-III (5-5-5).** FL 161 pr. to 162; 162 pr. to 163. Fundamentals of Portuguese. Stress on language skills; progressive emphasis on conversation. Exposure to Luso-Brazilian civilization.
- 261-262-263. **SECOND YEAR PORTUGUESE I-II-III (5-5-5).** Pr., FL 163 or equivalent. FL 261 pr. to 262; 262 pr. to 263. Exceptions to this sequence may be granted by departmental consent or when course offerings so require. Stress on language skills; structural review and composition; readings in Luso-Brazilian literature. Exposure to Luso-Brazilian civilization.

Russian

- 171-172-173. **FIRST YEAR RUSSIAN I-II-III (5-5-5).** FL 171 pr. to 172; FL 172 pr. to 173. Fundamentals of Russian. Stress on language skills; progressive emphasis on conversation. Exposure to Russian civilization.
- 271-272-273. **SECOND YEAR RUSSIAN I-II-III (5-5-5).** Pr., FL 173 or equivalent. FL 271 pr. to 272; FL 272 pr. to 273. Exceptions to this sequence may be granted by departmental consent or when course offerings so require. Stress on language skills; structural review and composition. Readings in Russian literature; continued exposure to Russian civilization.
371. **RUSSIAN LITERATURE FROM 1820-1860 IN TRANSLATION (3).** Literary history of the period, selected works by Pushkin, Lermontov, Gogol, Goncharov, Turgenyev.
372. **RUSSIAN LITERATURE FROM 1860-1917 IN TRANSLATION (3).** Dostoevsky, Tolstoy, Chekhov.
373. **SOVIET RUSSIAN LITERATURE 1917 TO PRESENT IN TRANSLATION (3).** Gorky, Sholokhov, Mayakovsky, Pasternak, Solzhenitsyn and others.

FRENCH ADVANCED UNDERGRADUATE AND GRADUATE COURSES

520. **FRENCH FOR INTERNATIONAL TRADE (3).** Pr., FL 329 or equivalent. Practice in handling, preparing and translating international trade correspondence, documents and related legal procedures in French. Development of case studies and other international trade group work in French and in English, under simulated real-life pressures.
521. **ADVANCED FRENCH CONVERSATION AND PHONETICS (3 OR 5').** Pr., four 300-level French courses or equivalent. Training in oral French to increase vocabulary, improve fluency and pronunciation. May be repeated once for credit.

*300 and 500-level French and Spanish courses will carry 5 quarter hours of credit only when taken in the Alabama-Auburn Academic Summer Abroad Program.

522. **ADVANCED FRENCH COMPOSITION AND STYLISTICS (3 OR 5').** Pr., four 300-level courses or equivalent. Exercises in advanced grammar and syntax designed to enhance the student's linguistic ability. Practice in composition, *explication de texte*, and in the use of stylistic devices derived from significant literary sources. May be repeated once for credit.
523. **ADVANCED FRENCH CIVILIZATION (3 OR 5').** Pr., four 300-level French courses or equivalent. An in-depth study of French civilization, with emphasis on the relationship of history, arts, and literature from the Middle Ages to the present.
524. **FRENCH LITERATURE SINCE WORLD WAR II (3).** Pr., four 300-level French courses or equivalent. Consideration, analysis, and criticism of selected authors and movements in letters, theater, cinema, and other media.
525. **FRENCH LITERATURE OUTSIDE CONTINENTAL FRANCE (3).** Pr., four 300-level French courses or equivalent. Consideration, analysis, and criticism of selected French literature from Africa, the Antilles, Canada, and other French-speaking areas.
526. **SEMINAR IN ADVANCED LANGUAGE SKILLS (3).** Pr., four 300-level French courses or equivalent. Practice in writing and speaking French. Exercises include compositions and exposés. May be repeated once for credit.
527. **SEMINAR IN FRENCH LITERARY GENRES AND MOVEMENTS (3 OR 5').** Pr., four 300-level French courses or equivalent. Intensive readings in French literature from selected genres or movements.
528. **RESEARCH METHODS (1).** Pr., four 300-level French courses or equivalent. An introduction to the methods of scholarly investigation in literary history and criticism. Special emphasis is given to practical training in the use of bibliographical resources and in the preparation of formal written presentations of research results.

SPANISH ADVANCED UNDERGRADUATE AND GRADUATE COURSES

530. **MIDDLE AMERICAN SHORT STORY (3).** Pr., four 300-level Spanish courses or equivalent. The short story in Middle America, with emphasis on the modern and contemporary periods.
531. **SOUTH AMERICAN SHORT STORY (3).** Pr., four 300-level Spanish courses or equivalent. The short story in South America, with emphasis on the modern and contemporary periods.
532. **MIDDLE AMERICAN THEATER (3).** Pr., four 300-level Spanish courses or equivalent. The theater in Middle America, with emphasis on the contemporary period.
533. **SOUTH AMERICAN THEATER (3).** Pr., four 300-level Spanish courses or equivalent. The theater in South America, with emphasis on the contemporary period.
534. **CERVANTES (3).** Pr., four 300-level Spanish courses or equivalent. The prose works of Cervantes with special emphasis on *Don Quixote*.
535. **CONTEMPORARY SPANISH POETRY (3).** Pr., four 300-level Spanish courses or equivalent. Spanish poetry since 1900.
536. **CONTEMPORARY SPANISH THEATER (3).** Pr., four 300-level Spanish courses or equivalent. The Spanish theater since 1900.
537. **CONTEMPORARY SPANISH PROSE FICTION (3).** Pr., four 300-level Spanish courses or equivalent. The development of prose fiction from the eighteenth century to modern times.
538. **CONTEMPORARY SPANISH-AMERICAN POETRY (3).** Pr., four 300-level Spanish courses or equivalent. Poetic forms, leading movements, and principal poets in Spanish America since Modernism.
539. **SEMINAR IN COMPOSITION AND STYLISTICS (3 OR 5').** Pr., four 300-level Spanish courses or equivalent. Advanced training in composition and stylistics with specific course materials determined by needs of students. May be repeated once for credit.
540. **SEMINAR IN CONVERSATION AND PHONETICS (3 OR 5').** Pr., four 300-level Spanish courses or equivalent. Advanced training in conversation and phonetics with specific course materials determined by needs of students. May be repeated once for credit.

GRADUATE COURSES IN FRENCH AND SPANISH

A non-sequential offering of courses required of students pursuing the degrees of Master of Arts in French, Master of Arts in Spanish, Master of French Studies, Master of Hispanic Studies, and Master of Arts in College Teaching. Representative works, literary movements, and techniques of literary criticism within respective genres of French, Spanish American, and Spanish literature are emphasized and analyzed in depth. A background in the history of the French language and of the Spanish language is presented and required of all Master's candidates. Courses may be taken concurrently.

*500 and 600-level French and Spanish courses will carry 5 quarter hours of credit only when taken in the Alabama-Auburn Academic Summer Abroad Program.

FRENCH GRADUATE COURSES

620. **HISTORY OF THE FRENCH LANGUAGE (3).** The history of the language from its Latin origins to the present day. Phonological, morphological, syntactic, and lexical developments are traced. External factors affecting these developments are considered as well.
621. **MEDIEVAL FRENCH LITERATURE (3).** An introduction to medieval French literature and the language in which it was composed. Representative samples of texts from different genres are read and examined mainly from a literary viewpoint.
622. **TOPICS IN FRENCH LITERATURE (3).** Focus of special aspects of French literature, along with social, economic and cultural reflections. The specific focus of this course will be announced at least one quarter prior to its being scheduled.
623. **SIXTEENTH-CENTURY FRENCH LITERATURE (3).** The development of French prose, poetry and drama during the sixteenth century. Prevailing elements of Renaissance thought and expression are considered through the works of representative authors.
624. **SEVENTEENTH-CENTURY FRENCH LITERATURE I (3).** The development of French poetry and prose during the seventeenth century. Major movements such as *preciosité* and Neoclassicism are treated through the works of representative authors.
625. **SEVENTEENTH-CENTURY FRENCH LITERATURE II (3).** The development of French drama during the seventeenth century. Works by Corneille, Molière and Racine are emphasized.
626. **EIGHTEENTH-CENTURY FRENCH LITERATURE I (3).** The development of French literature during the eighteenth century, with emphasis on drama, *contes philosophiques* and major works of the philosophers of the Enlightenment.
627. **EIGHTEENTH-CENTURY FRENCH LITERATURE II (3).** The development of the French novel during the eighteenth century. Major trends and themes (*roman picaresque, roman épistolaire, sensibilité pré-romantique*) are treated through the works of representative authors.
628. **NINETEENTH-CENTURY FRENCH LITERATURE I (3).** The development of French poetry and drama during the nineteenth century. Major movements such as Romanticism, Parnassianism and Symbolism are treated through the works of representative authors.
629. **NINETEENTH-CENTURY FRENCH LITERATURE II (3).** The development of French prose, particularly the novel, during the nineteenth century. Major movements such as Romanticism, Realism and Naturalism are treated through the works of representative authors.
660. **TWENTIETH-CENTURY FRENCH LITERATURE I (3).** The development of French literature before World War I. An in-depth study and analysis of major authors and movements in all genres.
661. **TWENTIETH-CENTURY FRENCH LITERATURE II (3).** The development of French literature between World War I and World War II. Major literary trends and movements in all genres are treated through the works of representative authors.
662. **DIRECTED READINGS IN FRENCH LITERATURE (1-3).** Supervised study in specialized areas. Registration is by permission of the department and the instructor. May be repeated for credit.
663. **INTRODUCTION TO COLLEGE-LEVEL FRENCH INSTRUCTION (1).** Instruction for graduate teaching assistants including critical observation of performance and guidance by a designated supervisory professor. May be repeated for a maximum of two credits.
699. **RESEARCH AND THESIS (CREDIT TO BE ARRANGED).**

SPANISH GRADUATE COURSES

630. **HISTORY OF THE SPANISH LANGUAGE (3).** The history of the language from its Latin origins to the present day. Phonological, morphological, syntactic and lexical developments are traced. External factors affecting these developments are considered as well.
631. **MEDIEVAL SPANISH LITERATURE (3).** An introduction to medieval Spanish literature and the language in which it was composed. Representative samples of texts from the different genres are read and examined mainly from a literary viewpoint.
632. **EARLY DEVELOPMENT OF THE SPANISH THEATER (3).** A critical and historical study of the development of the theater from the *Auto de Los Reyes Magos* through Lope de Vega.
633. **GOLDEN AGE SPANISH THEATER (3).** A critical and historical study of the theater of the seventeenth century after Lope de Vega.
634. **EIGHTEENTH AND NINETEENTH-CENTURY SPANISH THEATER (3).** An intensive study of the Spanish theater from 1700 to 1900.
635. **RENAISSANCE—GOLDEN AGE SPANISH PROSE FICTION (3).** A critical and historical study of the prose fiction of the Renaissance and Gold Age through representative authors.
636. **RENAISSANCE—GOLDEN AGE SPANISH POETRY (3).** Spanish poetry from the Renaissance to 1700.
637. **EIGHTEENTH AND NINETEENTH-CENTURY SPANISH POETRY (3).** Spanish poetry from 1700 to 1900.
638. **MIDDLE AMERICAN NOVEL (3).** The modern and contemporary novel in Middle America.

*500 and 600-level French and Spanish courses will carry five quarter hours of credit only when taken in the Alabama-Auburn Academic Summer Abroad Program.

639. **SOUTH AMERICAN NOVEL (3).** The modern and contemporary novel in South America, excluding the River Plate region.
640. **RIVER PLATE REGION NOVEL (3).** The modern and contemporary novel of the River Plate region in South America.
641. **DEVELOPMENT OF SPANISH-AMERICAN POETRY THROUGH MODERNISM (3).** The development of poetic forms, of leading movements and principal poets in Spanish America from the pre-Columbian epoch through Modernism.
642. **SEMINAR IN HISPANIC LITERATURE (3 or 5*).** Intensive readings in Hispanic literature from selected genres, authors, periods or movements. May be repeated once for credit.
643. **DIRECTED RESEARCH (1).** Study and research in specialized areas under the direct supervision of one faculty member. Registration by permission only. May be repeated twice for credit.
644. **INTRODUCTION TO COLLEGE-LEVEL SPANISH INSTRUCTION (1).** Instruction for graduate teaching assistants including critical observation of performance and guidance by a designated supervisory professor. May be repeated for a maximum of two credits.
699. **RESEARCH AND THESIS (CREDIT TO BE ARRANGED).**

Forestry (FY)**

Professors Thompson, Head, Biblis, Goggans, Johnson, Tang
Associate Professors Beals, Flick, Gjerstad, Lanford, Larsen, Lyle
Assistant Professors Brewer, Campbell, Davis, DeBrunner, Elder, Golden, Meldahl, Mills
Instructor Tufts

Forest Management (FY)

300. **INTRODUCTION TO FORESTRY (2). LEC. 2.** Summer. An orientation course for persons entering the forest management curriculum. Basic forestry concepts of multiple use and sustained yield. Problems of timber, water, wildlife, range, and recreational management, and major careers for professional foresters.
301. **DENDROLOGY (3). LAB. 9.** Pr., BI 102. Summer. Taxonomy and identification of important forest plants of the United States.
302. **FOREST BIOLOGY (2). LAB. 6.** Pr., BI 102. Summer. Field exposure to important principles of forest biology and some examples of their practical applications to forest resource management.
304. **FOREST SURVEYING (4). LAB. 12.** Pr., MH 162. Summer. Basic concepts and procedures of surveying as applied to forestry.
305. **FIELD MENSURATION (3). LAB. 9.** Pr., MH 162. Summer. Basic concepts and procedures for measuring trees and stands, units of measure used in forestry; application of log rules and volume tables; condition class mapping; elementary timber estimating.
306. **FOREST CARTOGRAPHY (1). LAB. 3.** Pr., MH 162. Summer. Basic concepts and procedures of drafting planimetric and topographic maps.
313. **SAMPLING I (4). LEC. 3, LAB. 3.** Pr., FY 304, 305, 306, MH 163. Fall, Winter. Basic concepts and procedures of statistical sampling as applied to forest resource assessment and management. Same as BY 313.
314. **SAMPLING II (4). LEC. 3, LAB. 3.** Pr., FY 313, IE 204. Winter, Spring. Continuation of Sampling I.
320. **FOREST TREE PHYSIOLOGY (3). LEC. 3.** Pr., CH 104, FY 301, 302, PS 200 or COI. Fall, Winter. Relationship between environmental and genetic factors. Metabolism and growth of individual trees.
350. **FARM FORESTRY (5). LEC. 5.** Pr., sophomore standing. Fall, Winter, Spring, Summer. (Not open to students in the Forestry degree curricula.) The place of farm forests in agricultural economy. The application of forestry principles to the problems of the farm woodland, especially as they relate to Alabama conditions.
400. **FORESTRY TOUR (1-3). LAB. (1-3).** Tours up to 2 weeks long to points of outstanding interest to foresters. May be taken more than once if different tours are involved.
415. **FOREST MENSURATION (5). LEC. 3, LAB. 6.** Pr., FY 313. Coreq, FY 314. Winter, Spring. Basic concepts and mathematical rationale underlying the measurement and estimation of various forest resources. Estimation of tree and stand growth and future yields.
421. **FOREST ECOLOGY (5). LEC. 4, LAB. 3.** Pr., AY 305, FY 314, 320, GL 110 or COI. Winter, Spring. Basic concepts and principles of forest ecology including forest community - environment relationships.
422. **FOREST GEOGRAPHY (2). LEC. 2.** Pr., or Coreq, FY 421. Winter, Spring. Silvical characteristics of specific tree species. Major forest types of the U.S.
423. **FOREST SITE EVALUATION (2). LEC. 1, LAB. 3.** Pr., GL 110, FY 421. Junior standing, Spring. Theoretical and field training in the classification and evaluation of forest habitats and land for various uses. Overnight field trips are required.

**The prerequisite may be waived by consent of the instructor concerned, for junior and senior students in other departments.

445. **FOREST FIRE CONTROL AND USE (3). LEC. 2, LAB. 3.** Pr., EC 202 or AEC 206, FY 421, or COI. Winter. Forest fire protection and use of fire by prescription including purpose, organization, equipment, economics, methods and tactics, public relations, and fire service management principles.
460. **WILDLAND RECREATION PHILOSOPHY AND POLICY (3).** Fall, Spring. Philosophy and policy of wildland recreation. Laws and traditions at federal, state, and local levels of government as well as industrial and other landowners' outlooks and developments relative to wildland recreation.
482. **FOREST RECREATION PLANNING AND MANAGEMENT (3). LEC. 2, LAB. 3.** Pr., FY 300, FY 301, FY 302. Fall, Spring. Planning for and management of lands which can provide recreational opportunity for people.
480. **FOREST PROBLEM I (0). LAB. 6.** Pr., FY 520, 540. Offered only under the "Satisfactory/Unsatisfactory" option. Winter. Definition, analysis, and solution of a forestry oriented problem. This is the first part of a two part exercise requiring two consecutive quarters for completion. Completion of the first part with a grade of "S" is prerequisite for part II.
481. **FOREST PROBLEM II (4). LAB. 6.** Pr., FY 480, 541. Spring. Continuation of FY 480.
482. **WOOD PROCUREMENT (2). LAB. 4.** Pr., FY 541 or COI. Spring. Principles, problems, and practices involved in providing raw material to the forest products industry.
495. **DIRECTED STUDY (1-5 EACH).** Pr., COI, and approval of department head, junior standing. Maximum of 10 hours in all areas as credit toward the Bachelor of Science degree. Areas of study defined as in FY 591.
499. **HONORS PROJECT (2-5).** Senior standing. A problem in the student's area of interest. Will test ability to do thorough library research, field work, data analysis, or other tasks related to high level independent work.

ADVANCED UNDERGRADUATE AND GRADUATE

517. **PHOTOGRAMMETRY (5). LEC. 3, LAB. 6.** Pr., FY 415 or COI. Fall, Winter, Spring. Use of aerial photographs in forestry. Particular emphasis is placed on specifications for forestry photographs, basic map control, planimetric mapping, timber type mapping and timber volume estimation. (Same as AN 517.)
520. **SILVICULTURE (5). LEC. 3, LAB. 6.** Pr., FY 421 or COI. Fall. Methods of controlling establishment, composition, growth, and quality of forest stands. Application of ecological principles to manipulation of forest ecosystems to meet specific objectives.
526. **FOREST WATERSHED MANAGEMENT (3). LEC. 2, LAB. 3.** Pr., GL 110, AY 305 and FY 421 or BY 513. Winter. A survey of forest hydrology as a specialized branch of forest ecology. The use of forests and forestry practices for the regulation of streamflow. An overnight field trip is required.
540. **FOREST ECONOMICS (4). LEC. 3, LAB. 3.** Pr., EC 202 or AEC 206, FY 415, or COI. Fall. Marginal analysis applied to forestry. Investment theory and forestry decisions. Theories of resource supply and economics of conservation. The structure and performance of forest products markets. The principles and influence of taxation in forestry. The U.S. as a component of the world forest economy.
541. **FOREST MANAGEMENT AND ADMINISTRATION (4). LEC. 3, LAB. 3.** Pr., FY 520, 540. Winter. Quantitative approaches to decision making in forestry. Models for forest regulation, multiple objective planning, and other selective forestry problems. Decision making in private and public forestry firms/agencies. Administration of large forestry programs and influence of outside regulations. Course will rely heavily on previous forestry courses.
542. **FOREST POLICY (3). LEC. 3.** Pr., FY 541 or COI. Spring. Analysis of the major social and resource characteristics of the forest regions of the U.S. Identification of policy issues at regional and national levels. Historical aspects of the U.S. forest policy. Analysis of major policy institutions.
548. **ADVANCED FOREST ECONOMICS (3). LEC. 3.** Pr., FY 540. Winter. Input-output relationships in forest production. Computation of financial maturity of trees and stands. Competition for resources in the management of forest properties. Uses of land and evaluation of intangible values associated with land.
570. **HARVESTING (3). LEC. 2, LAB. 3.** Pr., IE 204, FY 415, 520, 540. Winter. Harvesting systems, cost analysis, and environmental impacts.
590. **SEMINAR IN FORESTRY (1).** Pr., Senior standing. Advanced current literature and recent developments, with written and verbal reports on selected problems.

GRADUATE

610. **FOREST TREE IMPROVEMENT (5). LEC. 4, LAB. 3.** Pr., ZY 300 or COI. Principles of heredity as applied to forest trees and their management. Review of current knowledge in tree improvement. Principles of forest tree breeding. Study and evaluation of activities designed to produce genetically improved trees.
611. **FOREST SOILS (5). LEC. 3, LAB. 6.** Pr., AY 305 or 307. Importance of morphological, physical and chemical properties of forest soils in relation to growth of trees. Classification of forest soils on the basis of productivity. Special emphasis on forest soils in the southern pine region.
613. **FOREST COMMUNITY INVESTIGATIONS (5). LEC. 2, LAB. 8.** Pr., GL 110, or AY 307 or 305; FY 421 or BY 513. Methods of detecting, measuring, describing and analyzing forest communities and community types. Application to the study of forest ecosystems.
617. **REMOTE SENSING (3). LEC. 2, LAB. 3.** Pr., PS 206 or PS 221, BY 513 or FY 421, and COI. Spectral regions. Reflectance and emission of electro-magnetic energy. Types of remote sensing systems, including: photographic, in the visible and infrared spectral regions; line-scanning in the visible, infrared, and microwave spectral regions; and radar. The applications of remote sensing imagery to non-urban management.

- 641. ECONOMICS OF FORESTRY I (3). LEC. 3, Pr., EC 601 or COI.** Economics of forestry in relation with natural resource economics, capital theory and investment analysis in forestry contexts, principles of decision making, scheduling forest management activities.
- 642. ECONOMICS OF FORESTRY II (3). LEC. 3, Pr., FY 641 or COI.** Forest resource supply models, demand for forest products, structure and performance of U.S. forest industry, international forestry.
- 643. ECONOMICS OF FORESTRY III (3)(3). LEC. 3, Pr., FY 642 and EC 556 or COI.** Regional analysis of U.S. forest economy, economic and legislative history of American forestry, analysis of public and private forest policies including forest taxation.
- 691. DIRECTED STUDY (1-5).** Directed Study limited to a maximum of 5 hours in any specified area and to a maximum of 15 hours in all areas as credit towards Master's or doctoral degrees. All quarters. Areas of Directed Study: (A) Forest Management, (B) Forest Economics, (C) Forest Sampling, (D) Regression Analysis, (E) Linear Programming, (F) Forest Photogrammetry, (G) Forest Mensuration, (H) Forest Engineering, (I) Forest Soils, (J) Forest Ecology, (K) Forest Genetics, (L) Tree Physiology, (M) Wood Anatomy & Quality, (N) Uses of Wood & Derived Products, (O) Chemistry of Wood Glues, Finishes, & Impregnants, (P) Timber Physics, (Q) Recreation, (R) Remote Sensing, and (S) Wood Procurement.
- 695. SPECIAL PROBLEMS (3-8).** Area of study defined in FY 691. All quarters. A special problem in forestry or wood utilization. Such a problem will be of lesser magnitude than a thesis but will test the student's ability to do thorough library research as well as any needed laboratory or field work, and to prepare a comprehensive report on his findings. This work may be spread over more than one quarter, but shall be limited to a total of eight quarter hours.
- 699. RESEARCH AND THESIS. CREDIT TO BE ARRANGED.**
- 799. RESEARCH AND DISSERTATION. CREDIT TO BE ARRANGED.**

Forest Products (FP)

- 206. WOOD MEASUREMENTS (3). LEC. 2, LAB. 3, Pr., MH 160 or equivalent.** Spring. Wood measurements oriented toward the needs of students in forest products.
- 311. WOOD ANATOMY (5). LEC. 3, LAB. 6, Pr., FY 439.** Fall. Identification of commercial woods of industry by microscopic features. Comparative anatomy and phylogenetic relationships. Introduction to microtechnique and maceration techniques.
- 330. FOREST PRODUCTS (5). LEC. 3, LAB. 6, Pr., FY 439.** Fall. Specifications, grading and manufacture of wood products derived from forest lands, including an introduction to pulp and paper manufacture and other chemical and mechanical processes utilizing wood.
- 370. WOOD AS AN ART MEDIUM (3). LEC. 1, LAB. 4.** For students majoring in the Fine Arts. Winter. Basic technology and properties of wood as applied to its use as an art medium. Wood identification, design of wood forms, and effect of moisture on the dimensional stability of wood. Design problems involving wood.
- 439. WOOD IDENTIFICATION AND PRODUCTS (3). LEC. 2, LAB. 3, Pr., FY 301.** Fall, Winter. The manufacture of lumber, plywood, paper, and various composition boards from wood. Modern production technologies used in forest products industries. Identification of important products and woods.

ADVANCED UNDERGRADUATE AND GRADUATE

- 513. MICROTECHNIQUE OF HARD MATERIALS (5). LEC. 1, LAB. 12, Pr., FY 311 or COI.** Preparation and sectioning of hard materials for microscopic study. Care and use of the sliding microtome and diamond saw, staining, counterstaining and mounting of sections.
- 525. WOOD GLUING AND LAMINATION (5). LEC. 3, LAB. 6.** Coreq., FY 311, Pr., PS 205. Winter. Types and characteristics of woodworking glues. The theory, design, and manufacture of laminates and other glued products. The student will be introduced to research techniques and procedures by pursuing a specific study that will culminate in a comprehensive report.
- 531. MECHANICAL PROPERTIES OF WOOD (5). LEC. 3, LAB. 6, Pr., FY 311, 525.** Spring. Mechanical properties of wood, factors affecting the strength of wood, principles used in design of wood structure. Testing procedures.
- 532. SEASONING AND PRESERVATION OF WOOD (5). LEC. 5, Pr., FY 311.** Winter. Principles and practices of seasoning and impregnation of wood, study of wood destroying agencies.
- 533. SEASONING AND PRESERVATION LABORATORY (2). LAB. 6, Pr., FY 532.** Spring. Required for forest products majors only. Laboratory study of techniques and equipment used in the seasoning and impregnation of wood.

GRADUATE

- 601. WOOD CHEMISTRY (5). LEC. 2, LAB. 9, Pr., FY 330, CH 207 or TE 424.** Spring. Detailed physical and chemical nature of cellulose and modified cellulose and their derivatives. Study of the lignocellulose complex. Chemical analysis of wood.

Foundations of Education (FED)

Associate Professors Spencer, *Head*, Greenshields, G. M. Halpin, G. W. Halpin,
Lauderdale, Littleford,
Miller, Robison, Trentham, and Wilmoth
Assistant Professors Deaton, Hilyer, Rudder, and Schuessler
Instructors Guthery and Herring
Adj. Assistant Professor Bryan

213. **HUMAN GROWTH AND DEVELOPMENT (5). LEC. 4, LAB. 2.** Pr., sophomore standing. Teacher and the school in the direction, measurement, and evaluation of individual growth and development by using various sociological, philosophical, and psychological theories. Laboratory experiences required.
214. **PSYCHOLOGICAL FOUNDATIONS OF EDUCATION (5). LEC. 4, LAB. 2.** Pr., sophomore standing. The psychological dimensions of the educational process. The processes, conditions, and evaluation of learning, and related methodologies of teaching. Laboratory experiences and evaluation of the Pre-teaching Field Experience. For description of the Pre-teaching Field Experience Program, see Professional Requirements. Sect. C under School of Education.
300. **EDUCATIONAL PSYCHOLOGY (5). LEC. 4, LAB. 2.** Pr., sophomore standing. Learning and motivation from a developmental perspective for the purpose of gaining insight into an understanding of the learning process and of the individual involved in this process. This experience provides an integrated theoretical base for educational practice. Enrollment limited to education majors.
320. **SOCIAL FOUNDATIONS OF EDUCATION (5). LEC. 4, LAB. 2.** Pr., junior standing. The relationship of the school and contemporary society and the influence of cultural heterogeneity upon the teaching-learning process. Laboratory experiences focus upon mastering basic tools for studying the school as a dynamic social system.
350. **CULTURAL FOUNDATIONS OF EDUCATION (5). LEC. 5.** Pr., junior standing. Analysis of education giving emphasis to the act of teaching both in theory and practice. Regardless of disciplinary emphasis, the concerns of educational purpose, curriculum and pedagogy will be the focus of the courses. Students will select one of the following disciplinary options: (a) philosophy of education, (b) history of education, (c) social foundations of education, (d) comparative education. Enrollment limited to education majors.
400. **MEASUREMENT AND EVALUATION IN EDUCATION (5). LEC. 4, LAB. 2.** Pr., FED 300 or equivalent and junior standing. Measurement and evaluation as an integral part of the teaching-learning process. Focus is on (a) identifying and defining intended learning outcomes, (b) constructing or selecting tests and other evaluation instruments that are relevant to specified outcomes, and (c) interpreting and using results in determining attainment of educational goals and improving learning and instruction. Enrollment limited to education majors.
480. **PHILOSOPHICAL FOUNDATIONS OF EDUCATION (5).** Pr., FED 320 or equivalent. Educational movements and ideas in Western culture which influence modern educational practices. Evaluation of laboratory experiences and the Professional Internship through philosophical analysis of educational concepts and problems.

ADVANCED UNDERGRADUATE AND GRADUATE

510. **MEASUREMENT AND EVALUATION OF THE INDIVIDUAL IN EDUCATION (5).** Pr., FED 400 or COI. An in-depth study of the principles and techniques of measurement and evaluation which are applicable to educational settings. Emphasis will be given to both the theoretical and the practical. Special problems and issues will also be examined.
515. **FOUNDATIONS OF CLASSROOM MANAGEMENT (4).** Focus on analysis and comparison of various theories of classroom management and their applications to the classroom situation.
520. **EDUCATIONAL SOCIOLOGY (5).** Pr., SY 201 or equivalent. The school as a social institution. Group interaction, formal and informal structure and organization, and the relationship of education to other social institutions.
534. **PERSONALITY DYNAMICS AND EFFECTIVE BEHAVIOR (5).** Pr., ten hours of psychology. Analysis of adaptive and maladaptive behavior. Not open to students majoring in psychology.

GRADUATE

600. **EDUCATION IN MODERN SOCIETY (5).** Pr., graduate standing. The interaction of historical, philosophical and sociological considerations affecting education in modern society.
601. **SOCIAL FOUNDATIONS OF EDUCATION (5).** Pr., graduate standing. Man as a social being, his social relationships and inventions, and value patterns. Directions and support of educational developments in relation to various socio-economic structures.
602. **SOCIAL CHANGE AND EDUCATIONAL DEVELOPMENT (5).** Pr., graduate standing. Major current theories of social change and their practical application in improving the school and directing social innovations which sustain educational improvements.
603. **SOCIAL AND CULTURAL DIVERSITY AND AMERICAN EDUCATION (5).** An investigation of the educational responses to social and cultural pluralism in contemporary American society.
605. **URBANIZATION AND EDUCATIONAL DEVELOPMENT (5).** Developments in the concentration of population, wealth, and cultural dissemination in urban areas. The changing character of this concentration, and its impact on educational agencies regarding different population groups and different areas of educational service.

- 617. ADVANCED EDUCATIONAL PSYCHOLOGY (5).** Major psychological theories and research which have direct implication for educational practice. Key topics include learning, the learner, individual differences, motivation, discipline, measurement and evaluation with emphasis on the practical as well as the theoretical.
- 618. IMPLICATIONS OF LEARNING THEORY FOR EDUCATION (4).** Pr., FED 300 or equivalent. Theories of learning including the appropriate aspects of acquisition, transfer, motivation, and retention with comparative analysis of theories and educational implications.
- 619. EDUCATIONAL IMPLICATIONS OF HUMAN DEVELOPMENT (4).** Pr., FED 300 or equivalent. A critical study of major concepts of human growth and development.
- 634. HISTORY OF EDUCATION (5).** The emergence of education as a formal institution, tracing its historical development from early Greek times to the present and emphasizing the historical antecedents which have helped to shape the role and functions of education in Western culture.
- 636. PHILOSOPHY OF EDUCATION IN AMERICA (5).** Major American contributions to the philosophy of education and their influence on educational practice. Need for, and procedures in, reexamining concepts in the light of recent scientific and cultural developments.
- 637. DEVELOPMENT AND STATUS OF EDUCATIONAL PHILOSOPHY (5).** Pr., FED 636 or consent of department head. Development of philosophy of education from the standpoint of its implications for educational practice. Several patterns of thought are considered including supernaturalism, idealism, realism, humanism, communism, existentialism, and experimentalism.
- 639. COMPARATIVE EDUCATION (5).** Pr., two quarters of graduate study or consent of department head. Comparative study of selected educational systems in nations in various stages of development. Special attention given to American educational issues in cross cultural contexts.
- 645. CURRENT PROBLEMS AND ISSUES IN THE FOUNDATIONS OF EDUCATION (5).** Pr., teaching experience. Selected issues in the sociological, psychological, historical and philosophical foundations of education which affect the total educational enterprise and its relation to society.
- 646. DIRECTED INDEPENDENT STUDY (1-6).** Special study in which the student's learning efforts are guided toward desired objectives. Includes evaluation by professor and student at regular intervals.
- 647. FOUNDATIONS IN CURRICULUM AND TEACHING (5).** Introduction to principles and processes related to curricular and instructional development, designs, and utilization. Emphasis on historical developments, problems in curricular organization and evaluation, forces affecting curriculum change, and current issues and significant research that contributes to the general knowledge of curriculum and instruction.
- 650. SEMINAR IN FOUNDATIONS OF EDUCATION (3-10).** May be repeated for credit not to exceed 10 hours. Historical, philosophical, sociological, psychological, and research issues and their impact on education.
- 661. RESEARCH AND EXPERIMENTATION IN EDUCATION (5).** Research methods, design of experiments, and evaluation; data sources, research planning, elements of scientific method and proposal writing. Current trends in educational research.
- 662. NONPARAMETRIC STATISTICAL ANALYSIS (5).** Pr., FED 661. (Credit not allowed to meet minimum research requirements for doctoral students.) Common nonparametric statistical tests with special emphasis on nominal and ordinal data; estimation and multi-sample designs; emphasis on education applications and statistical models.
- 672. STATISTICAL METHODS IN EDUCATION (5).** The need and importance of applying statistical methods to the study of educational problems, statistical methods appropriate to education, and interpretation of meanings of statistical analyses.
- 673. RESEARCH AND EXPERIMENTAL DESIGN (5).** Pr., FED 672. Relationship of design to validity; significance of variables; testing hypotheses; evaluation of research and research findings.
- 675. ADVANCED STATISTICAL METHODS IN EDUCATION (5).** Pr., FED 672. Analysis of variance and covariance; correlation analysis and linear regression. Simple and complex factorial designs applied to educational research.
- 676. ADVANCED RESEARCH AND EXPERIMENTAL DESIGN (5).** Pr., FED 675. An extensive examination of the nature and character of experimental design in educational research including the development of appropriate analytical techniques.
- 680. EDUCATIONAL PROGRAM AND CURRICULUM EVALUATION (5).** Pr., FED 510, 661, or COI. An intensive and critical study of various views of program and curriculum evaluation in education. Methods of evaluating programs will be examined, using available models and data gathering procedures.
- 682. TECHNIQUES OF SCALE CONSTRUCTION (4).** Pr., FED 510 or PG 515 and FED 672 or COI. The rationale and development of instruments to assess attitudes will be presented and the analysis of data from questionnaires, surveys and other scale types will be considered. Students will be required to design and conduct a preliminary validation of an attitude scale.
- 685. THEORY AND FUNCTION OF EDUCATIONAL MEASUREMENT (4).** Pr., FED 510, 673 or equivalents. Theory and statistical properties of test scores, classical test score theory and latent trait models will be presented. Emphasis will be on the conceptual as well as the technological application of test theory to education.

Geography (GY)

Assistant Professors Bagwell, *Acting Head*,
Dawsey, Dorman, Icenogle, and Jeane

- 102. WORLD GEOGRAPHY (5).** Man and his work in relation to the Earth as a planet, location, climate, land forms, water bodies, minerals, soils, biota.

214. **PHYSICAL GEOGRAPHY (5).** Selected elements of the earth's physical system to include such items as landforms, basic weather elements, soils, and vegetation.
215. **CULTURAL GEOGRAPHY (5).** Selected elements of cultural geography to include basic concepts, review of literature, and influence of man in changing the face of the earth.
300. **WEATHER AND CLIMATE (5).** Weather and climate: causes and controls. Characteristics and distribution of world climates and their economic and social effects. Not open to students having credit for GY 213.
302. **ECONOMIC GEOGRAPHY (5).** Distribution and environmental relationships of man's principal economic activities.
303. **THE SOVIET UNION—LAND AND PEOPLE (5).** General elective. The physical and human geography of the U.S.S.R. and its role in international affairs.
304. **LATIN AMERICA—LAND AND PEOPLE (5).** A regional survey of economic and social developments, resources and products.
305. **THE UNITED STATES AND CANADA—LAND AND PEOPLE (5).** Human-use regions, resources, social and economic developments will be studied.
306. **EUROPE—LAND AND PEOPLE (5).** The influences of climate, surface features, and natural resources on the distribution of peoples, their industries and routes of trade. Consideration will be given to each country within its regional setting and to the relationship of Europe to the remainder of the world.
307. **ASIA—LAND AND PEOPLE (5).** Climate, topography, and natural resources and their influence upon the distribution of peoples, industries and commerce.
308. **AFRICA—LAND AND PEOPLE (5).** The principal regions of Africa with particular emphasis on the areas and countries of greater economic and international importance.
313. **COASTAL CLIMATOLOGY. (2 SM. HRS., 3 QTR. HRS.)** An introduction to the physical factors which result in climatic conditions of coastal regions, with emphasis on the northern Gulf of Mexico. No prerequisites.
315. **ALABAMA—LAND AND PEOPLE (5).** Geographic elements comprising the resource base for the state's economy.
399. **INDEPENDENT READINGS IN GEOGRAPHY (1-6).** May be repeated for a maximum of 6 hours credit. No more than 5 hours may be taken at one time. Course consists of directed readings and reports on topic approved by professor in charge.
400. **HISTORY OF GEOGRAPHIC THOUGHT (3).** The development of modern geographic thinking with special attention to the methodology employed in the science of geography.
401. **THE GEOGRAPHY OF INTERNATIONAL RELATIONS (5).** General elective. The interaction between the natural-physical environment and the international activities of world powers. Emphasis on the changing geographic and economic patterns in world affairs.
440. **CARTOGRAPHY (5).** Techniques of map construction, with attention given to both the drafting and interpretation of maps and other graphic presentations.

ADVANCED UNDERGRADUATE AND GRADUATE

504. **ADVANCED PHYSICAL GEOGRAPHY (5).** Pr., COI or GY 214. Geomorphological approach to the study of landforms in addition to in-depth analysis of earth systems.
505. **ADVANCED CULTURAL GEOGRAPHY (5).** Pr., COI or GY 215. Analysis of selected themes within the general field of cultural geography that illustrate man-land relationships.
507. **RESOURCES AND ENVIRONMENT (5).** An examination of the relationship between man and his physical environment emphasizing his use of natural resources and his impact on the land, sea, and atmosphere.
510. **ALABAMA—RESOURCES AND PROBLEMS (5).** Inventory and problematic aspects of Alabama resources, both human and natural.
520. **URBAN GEOGRAPHY (5).** The location, character, and growth of urban centers, with special attention to their interior patterns of land use and cultural development.
560. **DEVELOPMENT LOCATION ANALYSIS (5).** Introduction to the location of economic activity and an analysis of site decision making frameworks involving several types of developments.

GRADUATE

600. **SEMINAR IN CULTURAL GEOGRAPHY (5).** Pr., COI, or graduate standing. Designed for intensive study and analysis of selected themes within the broad field of cultural geography.
650. **GEOGRAPHY SEMINAR (5-10).** Pr., COI or graduate standing. Designed for students in intensive study and analysis of problems in geography.

Geology (GL)

Professor Carrington, *Head*

Associate Professor Cook

Assistant Professors Aadland, Gastaldo,

King, Sears, and Womochel

Instructors Burnell and Dickson

101. **INTRODUCTORY GEOLOGY I (5). LEC. 4, LAB. 2.** All quarters. The origin and classification of rock-forming and ore minerals. Sedimentary, metamorphic, and igneous processes, and classification of rocks that result from such processes. Rock deformation and mountain building. Not open to students having credit in GL 110 or 315.
102. **INTRODUCTORY GEOLOGY II (5). LEC. 4, LAB. 2.** Pr., GL 101. All quarters. Geomorphology through study of weathering, mass movement, formation of soils, and the erosional, transportation, and depositional aspects of groundwater, streams, oceans, glaciers, and wind. Not open to students having credit in GL 110 or 315.
103. **HISTORICAL GEOLOGY (5). LEC. 4, LAB. 2.** Pr., GL 102 or 110. Physical and biological history of the earth, with emphasis on the evolution of life forms.
110. **PHYSICAL GEOLOGY (5). LEC. 4, LAB. 2.** All quarters. An accelerated course in general geology for the student with an interest and/or aptitude in natural sciences. Survey of the important minerals and rocks with emphasis on the processes that effect their formation and destruction. Origin and classification of geologic structures. Not open to students having credit in GL 101, GL 102 or 315.
205. **PALEOBOTANY (5). LEC. 4, LAB. 2.** Pr., BI 102, sophomore standing. Fall. Morphology, anatomy, evolution, and stratigraphy of fossil plants, including microscopic fossils.
206. **INVERTEBRATE PALEOZOOLOGY (5). LEC. 4, LAB. 2.** Pr., BI 103, sophomore standing. Winter. Morphology, classification, and significance of selected genera representative of the diversity of fossil invertebrates, including microscopic fossils.
210. **APPLICATIONS OF PALEONTOLOGY (5). LEC. 4, LAB. 2.** Pr., GL 205 and 206, sophomore standing. Spring. The principles and techniques of paleontology will be considered: fossilization, speciation, evolution, paleoecology, paleogeography, and biostratigraphy.
215. **GEOLOGICAL FIELD METHODS (4). LAB. 12.** Pr., GL 110 and TS 102 or COI. Summer. Instruments and methods used in geological field mapping. Final report required.
231. **INDEPENDENT GEOLOGICAL MAPPING (2). LAB. 5.** Pr., GL 215, sophomore standing. All quarters. Independent mapping project of limited extent done with the consent and under the direction of a faculty member. A geological map and report must be completed, summarizing the investigation of the area chosen.
240. **STRUCTURAL AND GEOTECTONIC PRINCIPLES (5). LEC. 3, LAB. 4.** Pr., GL 110. Spring. Principles and processes of rock deformation, including description and classification of rock structures and methods of analysis. General history of the development of North America through understanding of plate structural developments.
301. **MINERALOGY (5). LEC. 4, LAB. 2.** Pr., CH 103, junior standing. Fall. Introduction to crystal chemistry and crystallography. Systematic study of representatives of important metallic and non-metallic mineral groups.
302. **OPTICAL MINERALOGY (5). LEC. 4, LAB. 2.** Pr., GL 301, junior standing. Winter. Theory and application of polarized light optics as applied to mineral identification, with emphasis on the study of rock-forming silicate minerals in thin sections.
305. **IGNEOUS AND METAMORPHIC PETROLOGY (5). LEC. 4, LAB. 2.** Pr., GL 302, junior standing. Spring. Principles and processes of intrusive and extrusive igneous activity and metamorphism. Description and classification of igneous and metamorphic rocks.
315. **ENGINEERING GEOLOGY (4). LEC. 3, LAB. 2.** Pr., junior standing. All quarters. Fundamental geological principles, materials and features that affect engineering projects and programs. Emphasis on pre-construction geological analysis in recognition of potential construction and post-construction hazards and problems. Not open to students having credit in GL 101, 102, or 110.
401. **SEDIMENTARY PETROLOGY (5). LEC. 4, LAB. 2.** Pr., GL 302, junior standing. Fall. Detailed description and classification of sedimentary rocks, with emphasis on the processes of sediment transportation, deposition and diagenesis in marine and non-marine environments.
411. **STRATIGRAPHY (5). LEC. 4, LAB. 2.** Pr., GL 240 and 401, junior standing. Winter. Descriptive geology pertaining to the discrimination, character, thickness, sequence, age, and correlation of rocks. Particular emphasis on field study of stratified rocks.
421. **ECONOMIC GEOLOGY (5). LEC. 4, LAB. 2.** Pr., GL 240, 305 and 401, junior standing. Spring. The origin, distribution and classification of mineral deposits formed by igneous, metamorphic and sedimentary (or secondary) processes. Introduction of methods of exploration and development.
431. **RESEARCH METHODS AND APPLICATION (1-4).** Pr., senior majoring in geology and/or consent of departmental faculty upon receipt of acceptable proposal. All quarters. Active participation in some phase of original research under supervision of a senior investigator. Credit evaluation determined by the departmental faculty on the basis of the formal presentation of the problem and the probable method(s) of investigation. May be taken more than one quarter for a maximum cumulative credit of four credit hours.

The following courses are available during Summer quarters at the Dauphin Island, Alabama, Sea Laboratory, and at the Gulf Coast Research Laboratory, Ocean Springs, Mississippi. Application forms must be obtained from the Department of Geology during final registration for the Winter Quarter preceding intended attendance.

Courses at Dauphin Island Sea Laboratory

120. **MARINE TECHNICAL METHODS I (3).** LAB. 8. Summer only. Pr., COI. Introduction to instruments and procedures utilized aboard marine research vessels, including physical, biological and geological measurements and sampling techniques.
121. **MARINE TECHNICAL METHODS II (3).** LAB. 8. Summer only. Pr., COI. Introduction to laboratory methods associated with chemical parameters of "nutrient analysis." Shipboard and practical skills developed.
202. **INTRODUCTORY MARINE GEOLOGY (6).** LEC. 4, LAB. AND FIELD 4. Summer only. Pr., Physical Geology and COI. Sedimentary environments, seafloor topography and history of ocean basins. Sampling and laboratory techniques and relationship of biota to sediment substrate.
501. **RECENT MARINE SEDIMENTATION (6).** LEC. 4, LAB. 4. Summer only. Pr., GL 202 or ZY 210 or ZY 330 or COI. Properties of marine sediments, coastal environments, continental margins, reefs, and the deep sea. Monitoring and measuring of shoreline changes.
502. **PROBLEMS IN MARINE PALEOECOLOGY (6).** LEC. 4, LAB. 4. September Preterm, alternate years. Pr., GL 101-102 or GL 110 and GL 206 or COI. Survey of principal Mesozoic and Cenozoic marine fossil groups, their paleoecology, and paleogeography.

Courses at Gulf Coast Research Laboratory

440. **PHYSICAL MARINE GEOLOGY (5).** LEC. 2, LAB. 5. Pr., consent of departmental adviser, junior standing. Summer only. General introduction to the physical processes resulting in the coastal morphology of Mississippi Sound, emphasizing erosional and depositional effects of waves and currents. Various environmental types (deltas, estuaries, etc.) and their characteristics are studied. Identification of ancient shorelines and ancient environments.
441. **CHEMICAL MARINE GEOLOGY (5).** LEC. 2, LAB. 5. Pr., consent of departmental adviser, junior standing. Summer only. Overview of the chemical systems in the oceans, with special emphasis on near-shore marine and estuarine environments. Basic analytical methods currently used to study the marine environment, with a strong concentration on instrumental methods of analyzing natural waters and sediments. Supervised research on chemical systems in the local estuaries, Mississippi Sound, and offshore.

ADVANCED UNDERGRADUATE AND GRADUATE

500. **PRINCIPLES OF GEOCHEMISTRY (5).** LEC. 3, LAB. 4. Pr., CH 105 or equiv. Fundamentals of chemical concepts as applied to geologic processes and solution of geologic problems. Survey of origin and distribution of elements in the solid earth. Laboratory emphasizes specific problems related to student's research and/or interests.
510. **ADVANCED PALEOBOTANY (5).** LEC. 3, LAB. 4. Pr., GL 205 or COI. Detailed investigations of plant groups and assemblages of the Upper Carboniferous of North America. Emphasis primarily on fossil plant associations of the Pottsville Formation of Alabama and adjacent states. Laboratory emphasis will be on paleobotanical and palynological techniques.
520. **MICROPALAEONTOLOGY (5).** LEC. 3, LAB. 4. Pr., BI 103, GL 103 or COI. Morphology, classification and biostratigraphic use of specific microfossil groups, including foraminifera, ostracodes and conodonts. Laboratory emphasis on collection, preparation and systematics of microfossils.
530. **COAL TECHNOLOGY (5).** LEC. 4, LAB. 2. Pr., GL 110 or COI. Introduction to origin, occurrence, exploration, development and beneficiation of coal. Emphasis on coal petrology as applied to rank, maceral and utilization parameters.

GRADUATE

610. **ADVANCED STRUCTURAL GEOLOGY (4).** LEC. 3, LAB. 2. Pr., GL 240. Application of analytical techniques to microscopic, mesoscopic and megascopic deformational features of rocks. Lab emphasis on solution of local problems.
640. **SPECIAL TOPICS IN ECONOMIC GEOLOGY (4).** LEC. 3, LAB. 2. Pr., GL 421 or COI. The practical and theoretical aspects of economic geology as applied to exploration and development of natural resources, particularly fuels, base metals and precious metals. Emphasis on specific case histories, preparation of maps and reports, and the analysis of drill-recovered, geochemical and geophysical data.
650. **ADVANCED STRATIGRAPHY (4).** LEC. 3, LAB. 2. Pr., GL 411. Chronologic study of Paleozoic, Mesozoic and Cenozoic rocks, their tectonic setting and paleogeography. Special emphasis on field problems.
660. **IGNEOUS PETROLOGY (4).** LEC. 3, LAB. 2. Pr., GL 305. Classification of igneous rocks. Origin, composition, and properties of magmas. Genesis of the major igneous rock associations. Petrochemistry.
661. **SEDIMENTOLOGY AND SEDIMENTARY PETROLOGY (5).** LEC. 4, LAB. 2. Pr., GL 401 (or 502) and 411. Selected readings, lectures, and group discussion of significant papers on processes of sedimentation and diagenesis. Emphasis on interpreting depositional and post-depositional history of specific rocks. Analytical techniques and microscopic analysis of evaporites, carbonates, and clastics.
662. **METAMORPHIC PETROLOGY (4).** LEC. 3, LAB. 2. Pr., GL 305. Metamorphic zones, facies and reactions. Applications of experimental data to metamorphic rock genesis. Studies of selected metamorphic rocks in the southern Piedmont.
670. **SEMINAR I—SOUTHEASTERN GEOLOGY (1).** Fall. Reports and discussion covering general topics of regional geologic interest as well as specific geologic problems unique to the southeastern U.S. Emphasis on geologic history, economic, structural and stratigraphic topics.

671. **SEMINAR II—URBAN AND ENVIRONMENTAL GEOLOGY (1).** Winter. Reports and discussion on specific urban and environmental geologic problems with emphasis on those of special importance to the southeastern U.S.
672. **SEMINAR III—GEOTECTONICS (1).** Spring. Reports and discussion on the principles, patterns and classification of tectonic phenomena.
680. **A,B,C,D,E,F,G. DIRECTED STUDIES (1-4).** Pr. CQI. All quarters. Non-thesis credit research in areas not currently offered as, or to supplement, lecture courses. Requires written final report. May be taken more than one quarter for a maximum cumulative credit of four credit hours. A. Economic Geology—Coal Technology. B. Geophysics. C. Igneous, Metamorphic, Petrology—Geochemistry. D. Paleontology. E. Sedimentary Petrology—Stratigraphy. F. Structural Geology—Geotectonics. G. Urban and Environmental Geology.
699. **THESIS (2).** All quarters. May be taken more than one quarter for a maximum cumulative credit of six credit hours.

Health, Physical Education and Recreation (HPR)

Professors Fourier, Head, and Means

Associate Professors Davenport, Dragoin, Fitzpatrick, Ford, Moore, Puckett, Todd, and Wilson

Assistant Professors Bengtson, Cherellia, Daniels, McLaughlin, Newkirk, Reeve, Rosen, Waldrop, and Washington

Instructors Drummond, Harmon, Milkovich, Murphy, Nunnally, Parker, and T. Woehle

The instructional program of the Department of Health, Physical Education and Recreation comprises (1) P. E. courses in physical education; (2) courses for students majoring or minoring in health education, physical education, and recreation administration; and (3) courses for students in preparation for teaching.

Health Classification. A health status form provided by the department must be signed by each student prior to participation in a physical education course involving physical activity.

Physical Education Requirements: Refer to School or program requirements.

Credit. All PE courses carry one hour credit per quarter (maximum of six quarter hours allowed on degree). No student may receive credit for a course in which the person has previously earned credit.

Students may not register for a beginning level course (Groups I and II) after having earned credit in the sport or dance area on an advanced level (Group III). Credit cannot be earned for a 200- and a 300-level course in the same sport.

101. **FOUNDATIONS OF PHYSICAL EDUCATION (1).** Understanding the relationship of human movement to body efficiency, aesthetics and health; self-appraisal; development of a personal plan for achieving and maintaining physical condition; selection of a personal program of developmental and recreational activities.
102. **SWIMMING FOR THE NON-SWIMMER (1).** Knowledge and skill in aquatics which are developed to a level sufficient to support a recreational interest and to assure one's own safety and the safety of others in and around water.
103. **INDIVIDUALIZED AQUATICS (1).** Provides water therapy, an understanding of adaptive movements, and aquatic skills.
107. **SPORTS AND DANCE IN AMERICAN CULTURE (1). (ATYPICAL).**
115. **ADAPTED PHYSICAL EDUCATION (1).** Concerned with the improvement and correction of physiological and anatomical remedial defects.

Group I (Vigorous)*

114. **SPECIAL FITNESS RELATED TOPIC.**
116. **WEIGHT CONTROL (1).** Caloric intake-output, nutrition, and the development of desirable exercise and nutritional habits. Activities selected according to individual needs and limitations. Open to students with health classifications "A" and "B."
117. **AEROBIC DANCE (1).**
125. **BASKETBALL (1).**
127. **SOCCER-SPEEDBALL (1).**

*Vigorous activities having special value with respect to development and maintenance of physical conditions.

- 130. **JOGGING (1).**
- 131. **FENCING (1).**
- 132. **WRESTLING (1).**
- 133. **ORIENTEERING.** Pr., signed Army form 131.
- 134. **JUDO (1).**
- 135. **WEIGHT TRAINING (1).**
- 136. **TRACK (1).**
- 137. **HANDBALL (1).**
- 138. **RACQUETBALL (1).**
- 139. **WILDERNESS SKILLS (1).** Pr., signed Army form 131.
- 140. **GYMNASTICS (1).** Understanding of gymnastics and skill in the use of different apparatus.
- 141. **TRAMPOLINE (1).**
- 142. **TUMBLING (1).**
- 144. **MODERN DANCE (1).** An understanding of dance as an art form.
- 145. **MODERN DANCE II (1).** Pr., PE 144 or equivalent.
- 146. **TAP DANCE (1).**
- 147. **BALLET (1).** Fundamentals and terminology of classical ballet.
- 148. **BALLET II (1).** Pr., PE 147 or equivalent.
- 149. **JAZZ DANCE (1).** Pr., COI.
- 230. **LIFE SAVING (1).** Pr., COI. Skills leading to certification in Red Cross Senior Life Saving.
- 231. **SKIN DIVING (1).** Pr., COI. Underwater swimming includes selection and use of swim fins, mask, snorkel. Underwater physiology and safety are emphasized.
- 234. **JUDO II (1).** Pr., PE 134 or equivalent.
- 238. **RACQUETBALL II (1).** Pr., PE 138 or equivalent.

Group II (Recreational Skills)**

- 150. **INTERMEDIATE SWIMMING (1).** Pr., COI.
- 151. **SPECIAL RECREATIONAL TOPIC.**
- 153. **SPRINGBOARD DIVING (1).** Pr., COI. Instruction in the basic dives; front, back, inward, reverse, and twist.
- 154. **RECREATIONAL SPORTS AND ACTIVITIES (1).** Survey of selected recreational pursuits such as billiards, croquet, darts, gym bowling, hiking, horseshoes, net games, and shuffleboard.
- 155. **ANGLING (1).** Skills in bait and fly casting. Selection and care of tackle.
- 156. **ARCHERY (1).**
- 157. **BADMINTON (1).**
- 158. **BOWLING (1).** Additional \$20.00 fee is payable to cooperating agency.
- 159. **GOLF (1).** Additional \$20.00 fee is payable to cooperating agency.
- 162. **RIFLE MARKSMANSHIP (1).** Pr., signed Army form 131.
- 163. **TENNIS (1).**
- 165. **CAMPING (1).** Understanding of American heritage in relation to the out-of-doors, camping trends, conservation, and the development of camping skills.
- 166. **FAMILY RECREATION (1).** Leisure time activities suitable for the family.
- 168. **BASIC EQUITATION (1).** Additional \$75.00 fee is payable to cooperating agency.

**Activities having special value as healthful, lifetime recreational pursuits.

- 170. **FOLK DANCE (1).**
- 172. **SOCIAL DANCE (1).** Mixers, as well as ballroom dancers: foxtrot, waltz, rhumba, tango, and other representative Latin dances
- 180. **SOFTBALL (1).**
- 181. **VOLLEYBALL (1).**
- 250. **SYNCHRONIZED SWIMMING (1).** Pr., COI.
- 259. **GOLF II (1).** Pr., PE 159 or equivalent. Additional green fee to be paid to cooperating agency.
- 263. **TENNIS II (1).** Pr., PE 163 or equivalent.

Group III (Varsity)

- 325. **VARSITY BASKETBALL (1).**
- 326. **VARSITY FOOTBALL (1).**
- 332. **VARSITY WRESTLING (1).**
- 336. **VARSITY TRACK (1).**
- 337. **VARSITY CROSS COUNTRY (1).**
- 340. **COMPETITIVE AND EXHIBITIONAL GYMNASTICS (1).**
- 350. **VARSITY SWIMMING (1).**
- 359. **VARSITY GOLF (1).**
- 362. **VARSITY RIFLERY (1).** Pr., signed Army form 131.
- 363. **VARSITY TENNIS (1).**
- 379. **VARSITY SOFTBALL (1).**
- 380. **VARSITY BASEBALL (1).**
- 381. **VARSITY VOLLEYBALL (1).**

Courses for the Major

- 118. **SKILLS AND CONCEPTS OF INDIVIDUAL AND DUAL ACTIVITIES I (3).** LAB. 6. Track and Field, archery, golf, wrestling and other individual and dual activities.
- 119. **SKILLS AND CONCEPTS OF INDIVIDUAL AND DUAL ACTIVITIES II (3).** LAB. 6. Tennis, badminton, racquetball, squash and handball.
- 120. **SKILLS AND CONCEPTS OF GYMNASTICS (4).** LAB. 8. Tumbling, trampoline and apparatus.
- 121. **SKILLS AND CONCEPTS OF AQUATICS (2).** LAB. 4. Strokes, survival swimming techniques, competitive swimming, springboard diving, and other aquatic activities.
- 122. **SKILLS AND CONCEPTS OF TEAM SPORTS (3).** LAB. 6. Power volleyball, soccer, speedball, basketball, softball, field hockey and other team sports.
- 123. **SKILLS AND CONCEPTS OF DANCE (4).** LAB. 8. Contemporary, folk, square, tap and ethnic dance.
- 195. **HEALTH SCIENCE (3).** Basic understanding concerning sound health practices and protection. Physical, mental, and social aspects of personal and community health are considered.
- 201. **HISTORY AND PRINCIPLES OF PHYSICAL EDUCATION (3).**
- 202. **BASKETBALL (3).** LEC. 2, LAB. 2. Fundamental skill techniques of basketball—offense, defense, and strategy.
- 203. **BASEBALL (3).** LEC. 2, LAB. 2. Offensive and defensive strategy, pitching, catching, infielding, outfielding, batting and baserunning.
- 204. **TRACK AND FIELD (3).** LEC. 2, LAB. 2. Fundamental skills and techniques of track and field athletics. The organizing and conducting of track meets.
- 206. **FOOTBALL (3).** LEC. 2, LAB. 2. Fundamentals of football and the different types of offense, defensive team strategy and generalship.
- 207. **CONDUCT OF DANCE FOR HIGH SCHOOL AND RECREATION PROGRAMS (3).** LEC. 2, LAB. 2.
- 208. **THEORY AND CONDUCT OF TEAM SPORTS (3).** LEC. 2, LAB. 2.
- 209. **THEORY AND CONDUCT OF INDIVIDUAL AND DUAL SPORTS (3).** LEC. 2, LAB. 2.
- 210. **THEORY AND CONDUCT OF GYMNASTICS (3).** LEC. 2, LAB. 2.
- 211. **SENSORIMOTOR ACTIVITIES (3).** LEC. 2, LAB. 2. Designed to develop understandings and skills concerning the broad concept of sensorimotor experiences for children, ages 4-8.

212. **ELEMENTARY SCHOOL ACTIVITIES (3).** LEC. 2, LAB. 2. Physical education activities suitable for the first six grades including teaching devices.
213. **DANCE FOR CHILDREN (3).** LEC. 2, LAB. 2. Includes all forms of dance suitable for elementary school age children with emphasis on creative dance activities which afford a progression in dance skills.
224. **FOOTBALL OFFICIATING (1).** LAB. 3.
225. **BASKETBALL OFFICIATING (1).** LAB. 3.
226. **SOFTBALL OFFICIATING (1).** LAB. 3.
227. **VOLLEYBALL OFFICIATING (1).** LAB. 3.
282. **PRINCIPLES OF RECREATION (3).** The significance and meaning of leisure; theories of play; the recreation movement in the United States. Principles of program planning and development at state and local levels of government, in schools and in industry.
295. **SCHOOL HEALTH (3).**
296. **COMMUNITY HEALTH (3).**
315. **KINESIOLOGY (4).** LEC. 3, LAB. 2. Pr., ZY 250-251, Physics 200.
351. **WATER SAFETY (3).** LEC. 1, LAB. 4. Pr., current Red Cross Sr. Life Saving Certificate. American Red Cross Advanced Swimmer and Water Safety Instructor courses leading to certification.
370. **DANCE SURVEY (3).** LEC. 2, LAB. 2. Comprehensive study of dance from primitive man to current styles of dance.
372. **DANCE PRODUCTION (3).** LEC. 2, LAB. 2. Apprenticeship in producing dance programs, exhibitions of physical activity and festivals.
373. **DANCE THEATRE (1-6).** Pr., COI. Participation in rehearsal lecture demonstrations, concert work and other presentations related to dance.
384. **PARK AND RECREATION MAINTENANCE (3).**
386. **RECREATION LEADERSHIP (3).**
387. **OUTDOOR RECREATION (3).**
388. **CAMP MANAGEMENT (3).**
389. **RECREATION INTERPRETATIVE SERVICES (3).** Pr., HPR 282. Principles and techniques used to communicate natural, historical, and cultural features of an outdoor recreation area to park visitors. Develops the ability to gather information, create, and present an interpretative program.
394. **ELEMENTARY SCHOOL HEALTH INSTRUCTION (3).** LEC. 2, LAB. 2.
395. **SECONDARY SCHOOL HEALTH INSTRUCTION (3).** LEC. 2, LAB. 2.
396. **DRUG USE AND ABUSE (3).** Investigation of stimulants and depressants with special emphasis on alcohol, narcotics, and tobacco. The effects of these substances on the human body and the social, economic, and community problems associated with their use.
404. **ATHLETIC INJURIES (3).**
405. **PHYSIOLOGY OF EXERCISE (4).** LEC. 3, LAB. 2. Pr., ZY 250-251. Principles of physiology with special emphasis on the application of physiological findings to practical problems related to human physical activity.
416. **ADAPTIVE PHYSICAL EDUCATION (3).** LEC. 2, LAB. 2. Pr., ZY 250, RSE 561, or COI. Review of anatomy, physiology, and psychology pertaining to special programs of physical education for the temporarily and permanently handicapped, with laboratory practice in posture training and remedial gymnastics.
- 423C. **PROGRAM IN AREA OF RECREATION ADMINISTRATION (5).** Pr., senior standing, HRA major only.
424. **INTRAMURALS AND OFFICIATING (3).** LEC. 2, LAB. 2.
426. **EVALUATION AND MEASUREMENT IN PHYSICAL EDUCATION (3).** LEC. 2, LAB. 2. Pr., FED 400.
429. **MOTOR LEARNING AND PERFORMANCE (4).** LEC. 3, LAB. 2. Pr., PG 211. Process of motor skill acquisitions; emphasis on variables that influence motor learning and performance.
446. **DIRECTED INDEPENDENT STUDY (1-10).** The student's learning efforts are guided toward desired objectives. Includes evaluation by professor and student of work accomplished at regular intervals.
450. **SPECIAL TOPICS (1-5).** Seniors and professors pursue cooperatively selected concepts and theoretical formulations normally in small groups.
485. **SOCIAL RECREATION (3).**
486. **PARK PLANNING (3).** Pr., HPR 282. Basic design principles as related to recreation and park planning. Consideration is given to design problems and solutions in park maintenance, vandalism, visitor control and other problems of recreation resource management.
487. **PARK MANAGEMENT (3).** Pr., HPR 282. An investigation into the operation of parks and resource areas with emphasis on the managerial function of the park administrative personnel.

494. **EMERGENCY CARE AND FIRST AID (3). LEC. 2, LAB. 2.**
495. **PRACTICUM (1-10).** Provides experiences closely relating theory and practice, usually carried on simultaneously.

Professional Courses

102. **ORIENTATION FOR TRANSFER STUDENTS (1).** Helps transfer from other curricula to understand teacher education and teaching as a profession.
414. **TEACHING IN HEALTH AND PHYSICAL EDUCATION IN ELEMENTARY AND SECONDARY SCHOOLS (3). LEC. 2, LAB. 2.** Pr., FED 320 or equivalent, and admission to Teacher Education.
423. **PROGRAM IN AREA OF SPECIALIZATION (3-5). LEC. 2, LAB. 2.** Pr., FED 320 or equivalent and admission to Teacher Education.
425. **PROFESSIONAL INTERNSHIP (15).** Pr., senior standing, admission to Teacher Education prior to Internship, appropriate professional courses. Provides supervised, on-the-job experiences in a school, college, or other appropriate setting. These experiences will be accompanied by regularly scheduled discussion periods designed to provide positive evaluation and analysis of the intern experience.

ADVANCED UNDERGRADUATE AND GRADUATE

509. **ADVANCED HEALTH SCIENCE (5).** Pr., COI. Principles and concepts basic to the improvement of individual and group living and the role of the home, school, and community in the development of sound physical and mental health.
517. **PHYSICAL EDUCATION FOR THE MENTALLY RETARDED (3). LEC. 2, LAB. 2.** The motor characteristics of the mentally retarded and the design of special programs of physical education; involves working with mentally retarded children.
519. **CURRENT PROBLEMS IN HEALTH EDUCATION (5).** Pr., COI.
520. **SOCIOLOGY OF SPORT (5).** Sport and culture. Attention is given to social processes and human behavior in sport situations.
572. **DANCE CONCEPTS AND RELATED CLASSROOM EXPERIENCES (5).**
580. **SCHOOL-COMMUNITY RECREATION (5).** Analysis of recreation as it relates to the school and the community.
592. **CONSUMER HEALTH EDUCATION (5).** Pr., Basic health science course or COI. Principles related to the selection and use of health products and services and the evaluation of health information.
594. **TEACHING SEX EDUCATION (5).** Pr., PG 444 or equivalent. Basic concepts, current research, resources, and teaching strategies related to human sexuality and education.
596. **PERSPECTIVES ON HEALTH EDUCATION (5).** Pr., Basic health science course or COI. Developments in school and public health, medicine, and related health sciences in relation to modern health education programs and practices.
597. **DRUG ABUSE EDUCATION (5).** Pr., COI. Practical and working understanding of drugs and drug abuse problems to prospective and in-service teachers, counselors, administrators, pharmacists, law enforcement personnel, nurses and others.

COURSES PRIMARILY FOR GRADUATE STUDENTS

601. **HISTORY OF SPORT AND PHYSICAL EDUCATION (5).** Historical backgrounds of sport and physical education with emphasis on the development of significant trends and the contributions of specific individuals.
615. **BIOMECHANICS OF SPORT (5).** In-depth investigation of the mechanical and musculoskeletal factors that affect human performance in sport activities; methods of cinematographic, electromyographic and electronic assessment of human motor skills with emphasis on determination of effective and efficient movement patterns.
616. **BIOMECHANICS OF SPORT INJURY (5).** Analysis of musculoskeletal factors, pathomechanics, and tissue properties that define the tolerance of the human body to the forces and torques developed in sport activities. Techniques for prevention of injury and design of protective equipment based on such information are explored.
619. **SCIENTIFIC PRINCIPLES APPLIED TO PHYSICAL EDUCATION AND ATHLETICS (5).** Pr., undergraduate major or minor in health and physical education. Specific application of physics, physiology, and psychology to the development of physical skills and related topics including reaction time, motivation, maturation, illusions, morale, and problems of group social living in physical education and athletics.
625. **INTERNSHIP (5-15).** Supervised, on-the-job experiences in a school, college, or other appropriate setting. These experiences accompanied by regularly scheduled, on-campus discussion periods and evaluation and analysis of the intern experience.
626. **PHYSICAL FITNESS A CRITICAL ANALYSIS (5).** Pr., ZY 250-251 or consent of department head. Critical analysis of physical fitness objectives of physical education through inquiry into current research in medicine, physiology of muscular activity, and physical fitness appraisal and guidance.
629. **PSYCHOMOTOR FOUNDATIONS OF PHYSICAL ACTIVITY (5).** Pr., HPR 429 or COI. Overview of the relationships between psychological factors and motor performance; methods of research in the areas of motor development, motor learning, and sport psychology; reviewing experimental studies, and current issues of psychomotor research.

630. **THEORETICAL BASES OF MOTOR LEARNING AND MOTOR CONTROL (4).** LEC. 3, LAB 2. Pr., HPR 629 or equivalent. Contemporary theories of motor learning and motor control; critical review and analysis of research related to models of motor performance; laboratory experiences that demonstrate current theoretical issues of motor learning and control.
635. **PSYCHOSOCIAL DIMENSIONS OF SPORT (5).** Pr., HPR 629 or equivalent. Psychological variables related to participation in sports; personality, motivation, and aggression as related to competition in athletic events.
646. **DIRECTED INDEPENDENT STUDY (1-6).** The student's learning efforts are guided toward desired objectives. Includes evaluation by professor and student of work accomplished at regular intervals.
650. **SEMINAR IN HEALTH, PHYSICAL EDUCATION, AND RECREATION (1-10).** Pr., graduate standing. Opportunity for advanced graduate students and professors to pursue cooperatively selected concepts and theoretical formulations.
651. **RESEARCH STUDIES IN EDUCATION IN AREAS OF SPECIALIZATION (5).** Review, analysis, and interpretation of available research with emphasis on designing new research to meet the changing needs of the school.
652. **CURRICULUM AND TEACHING IN AREAS OF SPECIALIZATION (5).** Teaching practices and reappraisal of selecting experiences and content for curriculum improvement.
653. **ORGANIZATION OF PROGRAM IN AREAS OF SPECIALIZATION (5).** Program, organization, and development of basic and supplementary materials for guiding teachers, faculties, and school systems in the continuous improvement of curriculum and teaching practices.
654. **EVALUATION OF PROGRAM IN AREAS OF SPECIALIZATION (5).** Evaluation and investigation of teaching effectiveness with attention also given to the utilization of human and material resources and the coordination of areas of specialization.

Prerequisites for the 651, 652, 653, and 654 courses are 18 hours of appropriate subject matter and 36 hours of psychology and professional education.

655. **MOVEMENT EDUCATION (5).** Developing a theoretical understanding of perceptual motor development and movement education, and in exploring the interdisciplinary implications of movement education for child development and the teaching-learning process.
662. **PHYSICAL DIMENSIONS OF COUNSELING (5).** Pr., CED 621 or 622. The physical aspects of the helping relationship; implementation of physical fitness skills to raise the energy level of the helper; use of physical fitness and challenge response activities as a tool in the helping relationship. (This course is also offered as CED 662.)
669. **ADVANCED PHYSIOLOGY OF EXERCISE (5).** Pr., HPR 405 or equivalent. Physiological aspects of fatigue, training, and physical fitness with special emphasis on the integration of organ systems in adapting to requirements of muscular exercise.
695. **PRACTICUM. (1-15).** Experiences closely relating theory and practice, usually carried on simultaneously.
696. **GRADUATE RESEARCH FORUM (1).** Required of all graduate students in health education and physical education. May be repeated but counted only once toward graduation. Presentations by graduate students of proposals and/or findings. Analysis of procedures and findings.
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED).** May be taken more than one quarter.
798. **FIELD PROJECT. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.

Program Designators—When appropriate, certain sections of the above common offerings are identified by programs within the departments by the use of letter designations as noted below:

(A) Health Education (B) Physical Education, and (C) Recreation Administration.

History (HY)

Professors Flynt, Head, Belser, Campbell, Harrison, Jones, Lewis, Maehl, Newton, Owsley, Rea, and Williamson

Associate Professors Bond, Cronenberg, Eaves, Fabel, and Kicklighter

Assistant Professors Beckwith, Hall, Henson, Olliff, and Pickering

101. **WORLD HISTORY (3).** A survey of world civilization from prehistory to 1400.
102. **WORLD HISTORY (3).** A survey of world civilization from 1400-1815.
103. **WORLD HISTORY (3).** A survey of world history from 1815 to the present.
171. **HONORS PROGRAM. ANCIENT AND MEDIEVAL HISTORY (3).** Pr., admission to Honors Program.
172. **HONORS PROGRAM. EARLY MODERN HISTORY (3).** Pr., admission to Honors Program.
173. **HONORS PROGRAM. MODERN HISTORY (3).** Pr., admission to Honors Program.
201. **A HISTORY OF THE UNITED STATES TO 1865 (5).**
202. **A HISTORY OF THE UNITED STATES SINCE 1865 (5).**

204. **TECHNOLOGY AND CIVILIZATION I (3).** The interaction of technology and of human culture from prehistoric times to the industrial revolution.
205. **TECHNOLOGY AND CIVILIZATION II (3).** The interaction of technology and of human culture from the industrial revolution to the end of the nineteenth century.
206. **TECHNOLOGY AND CIVILIZATION III (3).** The interaction of technology and other aspects of human culture in the twentieth century.
207. **EUROPEAN HISTORY, 1500-1815 (5).** A survey of early modern Europe through the French Revolution.
208. **EUROPEAN HISTORY SINCE 1815 (5).** A survey of Europe since the French Revolution.
274. **HONORS TECHNOLOGY AND CIVILIZATION I (3).** Interaction of technology and human culture from historic times to the industrial revolution for selected honors students from scientific and engineering disciplines.
275. **HONORS TECHNOLOGY AND CIVILIZATION II (3).** Interaction of technology and human culture from industrial revolution to the end of the 19th century for selected honors students from scientific and engineering disciplines.
276. **HONORS TECHNOLOGY AND CIVILIZATION III (3).** Interaction of technology and culture in 20th century for selected honors students from scientific and engineering disciplines.
300. **INTRODUCTION TO LATIN AMERICAN HISTORY (5).** Pr., sophomore standing. Latin American civilizations to the present with emphasis on the Colonial Period.
301. **INTRODUCTION TO FAR EASTERN HISTORY (5).** Pr., sophomore standing. The major cultural and institutional developments of the area.
306. **CONTEMPORARY HISTORY (3).** Recent events and their effect on the modern world.
308. **NAVAL HISTORY OF THE UNITED STATES (3).** The United States Navy from the American Revolution to the present including the evolution of naval technology and strategy and the role of the navy in defense, discovery, and diplomacy.
309. **MILITARY HISTORY OF THE UNITED STATES (3).** History of the United States military policy, strategy, and tactics, 1775 to the present (land warfare).
310. **GRECO-ROMAN HISTORY (5).** Pr., sophomore standing. The Classical or Hellenic Civilization from the Homeric Age to the reign of the Emperor Justinian.
311. **MEDIEVAL HISTORY (5).** Pr., sophomore standing. Europe from the fall of the Roman Empire to the Age of Discovery.
315. **AMERICAN BLACK HISTORY TO 1900 (5).** Pr., sophomore standing. Racial and cultural origins of the black, including African background, the slave trade, slavery in the New World, emergence of the free black, emancipation of the slaves, Reconstruction, and segregation.
322. **THE UNITED STATES IN WORLD AFFAIRS (3).** General elective. Pr., sophomore standing. The influence which the United States has exerted in international affairs.
350. **HISTORY OF POLITICAL PARTIES (5).** Pr., sophomore standing. Origin and growth of American political parties from the Federalist era to the present.
355. **HISTORY OF THE IBERIAN PENINSULA (5).** Spanish and Portuguese history, prehistoric to contemporary.
360. **CULTURAL AND POLITICAL HISTORY OF ITALY SINCE 1400 (5).** A survey of Italian history since the Renaissance.
371. **HISTORY OF THE WEST (5).** Pr., sophomore standing. The development of the West and its influence on American history.
380. **SCIENCE FICTION AS INTELLECTUAL HISTORY (5).** Pr., junior standing. The interaction between science, technology, and other aspects of human culture as dramatized in classic works of science fiction.
381. **HISTORY OF ALABAMA (5).** Pr., sophomore standing. A brief history of Alabama from the beginning to the present.

ADVANCED UNDERGRADUATE AND GRADUATE

500. **AMERICAN COLONIAL HISTORY (5).** The political, economic, and social history of the colonies from their founding to the end of the French and Indian War, 1763.
501. **THE AMERICAN REVOLUTION AND THE CONFEDERATION, 1763-1789 (5).** The new British Colonial policy, the War for Independence, and the first federal constitution and the movement to replace it.
502. **FEDERALIST AND JEFFERSONIAN AMERICA, 1789-1815 (5).** The establishment of the new federal government, the origins of American political parties, and the role of the United States in the French Revolutionary and Napoleonic Wars.
503. **THE AMERICAN SYSTEM AND JACKSONIAN DEMOCRACY, 1815-1850 (5).** Nationalism, sectionalism, egalitarianism, and expansion.
504. **THE CIVIL WAR (5).** The sectional controversy from the Compromise of 1850 to the beginning of hostilities in 1861, and the military, economic, social, and political aspects of the war.

505. **THE RECONSTRUCTION PERIOD (5).** An analysis of the social, economic, and political aspects of the years 1865-1877.
506. **UNITED STATES HISTORY, 1877-1914 (5).** Development of the United States.
507. **RECENT UNITED STATES HISTORY, 1914-1932 (5).** Development of the United States.
508. **MODERN AMERICA, 1932 TO THE PRESENT (5).** Development of the United States.
509. **NINETEENTH-CENTURY U.S. DIPLOMACY (5).** U.S. relations with foreign powers during the 19th century.
510. **TWENTIETH-CENTURY U. S. DIPLOMACY (5).** Emergence of America as a world power.
511. **SOCIAL AND INTELLECTUAL HISTORY OF THE UNITED STATES TO 1876 (5).** Selected areas of American thought ranging from Puritanism to the impact of Darwinism on the American mind.
512. **SOCIAL AND INTELLECTUAL HISTORY OF THE UNITED STATES SINCE 1876 (5).** Major intellectual movements in American society from social Darwinism to Progressivism and its legacy.
513. **THE SOUTH TO 1865 (5).** The origins and growth of distinctive social, economic, cultural, and ideological patterns in the South with emphasis on period 1815-1860.
514. **THE SOUTH SINCE 1865 (5).** Major trends in the South since the Civil War with emphasis on social, economic, cultural, and ideological development.
515. **AMERICAN BLACK HISTORY SINCE 1900 (5).** An analysis and interpretation of the role of American blacks in the development of the United States in the twentieth century.
516. **SOCIAL AND INTELLECTUAL HISTORY OF MODERN EUROPE (5).** Selected topics in social and intellectual history which have shaped modern European cultures.
517. **AMERICAN FOLK/ORAL HISTORY (3).** A cultural survey of the "common people" utilizing oral history.
526. **THE RENAISSANCE AND REFORMATION, 1400-1600 (5).** Europe during the Reformation and Renaissance.
527. **SEVENTEENTH-CENTURY EUROPE (5).** Emphasis on the Thirty Years' War, Scientific Revolution, overseas colonization, and European political developments in the age of Louis XIV.
528. **EUROPE, 1715-1789 (5).** A history of Europe from the Age of Absolutism to the collapse of the Old Regime.
529. **THE FRENCH REVOLUTION, 1789-1799 (5).** Background: causes and course of the Revolution in France.
532. **THE GENESIS OF MODERN GERMANY (5).** A survey of the political, constitutional, and cultural history of Germany to 1740.
533. **MODERN GERMAN HISTORY (5).** A general history of the German states since 1740.
535. **NAPOLEONIC EUROPE, 1799-1815 (5).** The rise and fall of the Consulate and the Empire in France and French hegemony in Europe.
536. **MODERN FRANCE (5).** From the *Ancien Regime* to the present.
543. **HISTORY OF EUROPE, 1815-1871 (5).** European history from the Congress of Vienna through the unification of Germany and Italy.
544. **EUROPE, 1871-1919 (5).** Emphasis on Central Europe, Germany, and Italy since unification.
545. **EUROPE SINCE 1919 (5).** Emphasis on the rise of totalitarianism, the Second World War, and the post-war period.
550. **EASTERN ASIA (5).** A history of China and Japan in the modern world.
551. **SOUTH AND SOUTHEAST ASIA (5).** The diverse cultures of the Asian periphery emphasizing the impact of the West in the recent period.
552. **THE CARIBBEAN AREA (5).** An analysis of the Caribbean as to its geographic, cultural, and strategic importance from 1492 to the present.
553. **SOUTH AMERICA TO 1900 (5).** The colonial and early national period.
554. **HISTORY OF MEXICO (5).** An analysis of the unique cultural development of Mexico.
555. **TWENTIETH-CENTURY SOUTH AMERICA (5).** A survey of the conflict between tradition and change in a developing continent.
556. **HISTORY OF MODERN RUSSIA, 1453-1917 (5).** A detailed history of the Russian nation in the modern era to the dissolution of the Empire.
557. **HISTORY OF THE SOVIET UNION SINCE 1917 (5).** The territories under the Bolshevik regime from the proclamation of the Bolshevik state to the present time.
571. **HISTORY OF MEDIEVAL ENGLAND (5).** A survey of English origins and institutions to the seventeenth century.
572. **HISTORY OF MODERN ENGLAND (5).** A survey of British history since the seventeenth century.
578. **TECHNOLOGY AND SOCIETY IN PRE-INDUSTRIAL TIMES (5).** The interplay between technology and human culture during selected periods of pre-industrial history.

579. **TECHNOLOGY AND SOCIETY IN THE INDUSTRIAL REVOLUTION (5).** Various approaches to the study of the interaction between technology, industry, and society in the United States and other countries during selected periods, normally in the late eighteenth and nineteenth centuries.

GRADUATE

600. SEMINAR IN AMERICAN HISTORY, 1763-1800 (5).
 601. SEMINAR IN AMERICAN HISTORY, 1800-1850 (5).
 602. SEMINAR IN AMERICAN HISTORY, 1850-1876 (5).
 603. SEMINAR IN AMERICAN HISTORY, 1876-1914 (5).
 604. SEMINAR IN AMERICAN HISTORY, 1914- (5).
 605. UNITED STATES FAR EASTERN DIPLOMACY (5). Alternate years.
 606. UNITED STATES LATIN AMERICAN DIPLOMACY (5). Alternate years.
 607. UNITED STATES ATLANTIC DIPLOMACY (5).
 608. AMERICAN SOCIAL AND INTELLECTUAL HISTORY (5).
 609. SEMINAR IN THE OLD SOUTH (5).
 610. SEMINAR IN THE NEW SOUTH (5).
 611. SEMINAR IN BLACK HISTORY (5).
 629. HISTORICAL METHODS (5).
 632. SEMINAR IN MEDIEVAL HISTORY (5).
 633. SEMINAR IN SIXTEENTH-CENTURY EUROPE (5).
 634. THE REVOLUTION OF 1917-1921 (5). Pr., HY 556.
 635. SEMINAR IN EUROPEAN HISTORY (5).
 636. COLONIAL LATIN AMERICA (5).
 637. LATIN AMERICA IN THE NATIONAL PERIOD, REVOLUTIONARY MOVEMENTS, AND NATIONAL DEVELOPMENTS (5).
 638. SEMINAR IN THE FRENCH REVOLUTIONARY AND NAPOLEONIC ERA (5).
 639. HISTORIOGRAPHY AND THEORY OF HISTORY (5). Fall, even-numbered years.
 640. TUDOR AND STUART ENGLAND (5). Alternate years.
 641. EIGHTEENTH-CENTURY ENGLAND (5). Alternate years.
 644. SEMINAR IN MODERN EUROPEAN DIPLOMACY (5).
 650. ARCHIVAL INTERNSHIP (10). Pr., HY 628.
 699. RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)
 799. RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)

READING COURSES

The following reading courses are offered in order to give the graduate student an opportunity for study in specialized areas and are rigorously supervised by the professors responsible for the fields. Registration is by permission of the department and the major professor.

620. DIRECTED READING IN AMERICAN HISTORY TO 1876 (5).
 621. DIRECTED READING IN AMERICAN HISTORY SINCE 1876 (5).
 622. DIRECTED READING IN AMERICAN DIPLOMACY (5).
 623. DIRECTED READING IN AMERICAN SOCIAL AND INTELLECTUAL HISTORY (5).
 624. DIRECTED READING IN LATIN AMERICAN HISTORY (5).
 625. DIRECTED READING IN FAR EASTERN HISTORY (5).
 626. DIRECTED READING IN ENGLISH HISTORY (5).
 627. DIRECTED READING IN EUROPEAN HISTORY (5).
 628. DIRECTED READING AND STUDY IN ARCHIVAL PROCEDURES (5).

Horticulture (HF)

Professors Perkins, Head, Amling, Chambliss, Norton, Orr, and Sanderson
Associate Professors Dozier, Perry, Ponder, and Rymal
Assistant Professor Smith

LANDSCAPE AND ORNAMENTAL HORTICULTURE

101. **INTRODUCTION TO HORTICULTURE (1). LEC. 1.** Fall. An orientation course for freshman introducing all fields in Horticulture.
221. **LANDSCAPE GARDENING (5). LEC.-DEM. 4.** Pr., BI 102. Principles of landscape gardening applied to the development of small home grounds and school grounds. The lecture-demonstration periods are devoted to the study of the identification and use of ornamental plants, landscape drawings, and the propagation and maintenance of ornamental plants.
222. **TREES (5). LEC. 3, LAB. 4.** Pr., HF 221 or COI. Identification, culture and use of ornamental trees in landscape plantings.
223. **EVERGREEN SHRUBS AND VINES (5). LEC. 3, LAB. 4.** Pr., HF 221 or COI. Identification, culture, and use of broadleaf and narrowleaf evergreens in landscape plantings.
224. **PLANT PROPAGATION (5). LEC. 3, LAB. 4.** Pr., BI 102. Basic principles and practices involved in the propagation of horticulture plants.
225. **FLOWER ARRANGING (3). LEC. 2, LAB. 2.** General elective. Principles and practices of flower arranging for the home.
226. **LANDSCAPE GRAPHICS (3). LEC. 2, LAB. 3.** The development of drawing and drafting skills used to evolve and communicate schematic and detail landscape design concepts.
321. **DECIDUOUS SHRUBS AND VINES (5). LEC. 3, LAB. 4.** Pr., HF 221 or COI. Identification, culture and use of deciduous shrubs and small trees in landscape plantings.
323. **GREENHOUSE ENVIRONMENT CONTROL (5). LEC. 4, LAB. 3.** Pr., BY 102, HF 224. Principles and practices of construction and utilizing greenhouses for various purposes such as plant propagation, crop production, and research.
324. **ELEMENTS AND PRINCIPLES OF LANDSCAPE DESIGN (5). LEC. 3, LAB. 4.** Pr., HF 221 and at least 5 hours from the plant materials courses to be taken previously or concurrently, or COI. The art elements and design principles as they relate to Landscape Design. The organization of outdoor spaces leading to the evolution of Landscape Designs emphasized.
328. **LANDSCAPE CONSTRUCTION (5). LEC. 2, LAB. 6.** Pr., HF 226, 324 or COI. Investigation of the principles and practices used in the detail design and implementation of a landscape site plan or landscape planting plan. Topics to be covered: drafting, surveying, properties of construction materials, earthwork, drainage, and specifications.
330. **HORTICULTURE INTERNSHIP (5).** May be taken more than once for a total of 15 hours. Pr., COI. To provide the student with practical on the job training under supervision in selected commercial establishments to include wholesale and retail nurseries, greenhouses, garden centers, landscape and landscape maintenance firms, and fruit and vegetable horticultural production units. Each term of employment will be for 1 quarter.
410. **HERBACEOUS ORNAMENTAL PLANTS (5). LEC. 3, LAB. 4.** Pr., HF 224, 323, BY 306 or COI. Identification, culture and use of herbaceous plant materials in the total landscape environment including interiorscapes.
415. **RETAIL GARDEN CENTER MANAGEMENT (5). LEC. 4, LAB. 2.** Pr., HF 222, 223, and 321 or COI. The following objectives will be covered: financing, selecting a location, designing a center, stocking, selling, personnel management, advertising, and maintaining plants on the lot.
425. **FLOWER SHOP MANAGEMENT (5). LEC. 4, LAB. 3.** Pr., HF 225, 522, MN 241, ACF 211, COI. Winter, even years. Principles and practices in the establishment and management of a retail flower shop. Store location, financing, buying, floral design, pricing, and merchandise control.
426. **MINOR PROBLEMS (3-5).** May be taken more than once for a total of 15 hours. Pr., COI. Selected problems in either vegetable production, pomology, food technology, or landscape and ornamental horticulture, on which independent library, field, laboratory, or green house investigations are made, under supervision of instructors.
427. **INTERMEDIATE LANDSCAPE DESIGN (5). LEC. 2, LAB. 6.** Pr., HF 324 or COI. Man, nature, art and technology and their influence on Landscape Design.
428. **ADVANCED LANDSCAPE DESIGN (5). LEC. 2, LAB. 6.** Pr., HF 328, 427, and at least 10 hours from the plant materials courses to be taken previously or concurrently, or COI. Continuation of HF 427.

ADVANCED UNDERGRADUATE AND GRADUATE

521. **CARE AND MAINTENANCE OF ORNAMENTAL PLANTS (5). LEC. 3, LAB. 4.** Pr., BY 306, 309. Winter. Principles and practices of the care and maintenance of trees and shrubs, including pruning, tree surgery, transplanting, and fertilization.
522. **FLORICULTURAL CROP PRODUCTION (5). LEC. 4, LAB. 3.** Pr., AY 304, BY 306, 309, HF 323, ZY 502 or COI. Floricultural crop production under management in greenhouse and outdoor conditions.

523. **NURSERY MANAGEMENT (5). LEC. 3, LAB. 4.** Pr., HF 224, BY 306, AY 304. Winter. Principles and practices of the management of a commercial ornamental nursery.
531. **ADVANCED LANDSCAPE GARDENING (4). LEC. 3, LAB. 4.** Pr., BI 101, HF 221, graduate standing. Principles and practices applying to the use of ornamental plant material in landscaping.
532. **CONTROLLED PLANT GROWTH (5). LEC. 3, LAB. 4.** Pr., AY 304, BY 306, CH 208, HF 323, junior standing. Controlling and directing growth of plants by manipulation of the environment and by the use of chemicals.
535. **ADVANCED CARE AND MAINTENANCE OF ORNAMENTAL PLANTS (5). UFC.** Pr., HF 521. This course will include visits to nurseries, landscape construction firms, and landscape maintenance firms. Visits will also be made to installation and maintenance sites. There will be on site participation in all phases of landscape installation and maintenance including extensive experience in problem diagnosis.

GENERAL HORTICULTURE

101. **INTRODUCTION TO HORTICULTURE (1). LEC. 1.** Fall. An orientation course for freshmen introducing all fields in Horticulture.
201. **ORCHARD MANAGEMENT (5). LEC. 3, LAB. 4.** Fall and Spring. Propagating, planting, pruning, cultivating, fertilizing, spraying, thinning, harvesting, grading, storing and marketing the most valuable fruits and nuts grown in the South.
308. **VEGETABLE CROPS (5). LEC. 3, LAB. 4.** Fall, Spring, Summer. Principles and special practices used in production of vegetable crops.
330. **HORTICULTURE INTERNSHIP (5).** May be taken more than once for a total of 15 hours. Pr., COI. To provide the student with practical on the job training under supervision in selected commercial establishments to include wholesale and retail nurseries, greenhouses, garden centers, landscape and landscape maintenance firms, and fruit and vegetable horticultural production units. Each term of employment will be for 1 quarter.
340. **INDUSTRIAL FOOD PRESERVATION TECHNOLOGY (5). LEC. 3, LAB. 4.** Pr., COI or junior standing. Winter, even years. Principles of food preservation as applied to industry. Processes considered include refrigeration, pasteurization, canning, freezing, drying, concentration, fermentation, pickling, salting, irradiation, and the use of food additives.
426. **MINOR PROBLEMS (3-5).** May be taken more than once for a total of 15 hours. Pr., COI. Selected problems in either vegetable production, pomology, food technology, or landscape and ornamental horticulture, on which independent library, field, laboratory, or greenhouse investigations are made, under supervision of instructors. Graduate credit limited to one quarter.
429. **FOOD SCIENCE SEMINAR (1).** Pr., senior standing. Winter. Lectures, discussions and literature reviews by staff, students, and guest lecturers.

ADVANCED UNDERGRADUATE AND GRADUATE

501. **COMMERCIAL VEGETABLE CROPS (5). LEC. 3, LAB. 4.** Pr., HF 308. Spring, odd years. Advanced course in production, storing, packaging, and marketing of the major commercial vegetable crops.
504. **FRUIT GROWING (5). LEC. 3, LAB. 4.** Pr., BI 102, HF 201, CH 207. Summer, odd years. Production and marketing of commercial tree fruits grown in the South.
505. **SMALL FRUITS (5). LEC. 5, LAB. 4.** Pr., BI 102. Spring, even years. Principles and practices involved in the production of strawberries, grapes, blueberries, and brambles.
506. **NUT CULTURE (5). LEC. 5, LAB. 4.** Pr., BI 102, CH 207, HF 201. Spring, odd years. Production and marketing of pecans, walnuts, and chestnuts.
543. **FOOD CHEMISTRY (5). LEC. 3, LAB. 4.** Pr., CH 207. Winter. The chemistry of the important components of foods and changes occurring during processing, storage and handling.
545. **FOOD ANALYSIS AND QUALITY CONTROL (5). LEC. 3, LAB. 4.** Pr., HF 543. Spring, even years. Sensory, chemical, and instrumental food analysis and its application to quality control and evaluation of grades and standards.

GRADUATE

601. **EXPERIMENTAL METHODS IN HORTICULTURE (5). LEC. 3, LAB. 6.** Any quarter. Purposes of research, discovery, and progress as related to the scientific methods; research programs, horticultural programs, selecting projects, reviewing literature, preparing project outlines, conducting experiments, recording data, analyzing data, and publication of results.
602. **SEMINAR (1).** May be taken more than once for a maximum of three hours credit. Fall, Winter, Spring.
603. **SPECIAL PROBLEMS IN HORTICULTURE (3-5). CREDIT TO BE ARRANGED.** Pr., graduate standing. Any quarter. Selected problems in vegetable production, pomology, food technology, or ornamental horticulture.
604. **PLANT GROWTH AND DEVELOPMENT (5). LEC. 4, LAB. 2.** Pr., CH 207 or BY 306, and COI. Spring, even years. Morphological and physiological changes in horticulture plants as induced by growth regulators and their theoretical implications in the improvement of horticultural crops production.
605. **NUTRITIONAL REQUIREMENTS OF HORTICULTURAL PLANTS (5). LEC. 4, LAB. 2.** Pr., BY 306. Spring, odd years. Nutritional requirements of horticulture crops and factors affecting these requirements.

606. **PHYSIOLOGY OF HORTICULTURAL PRODUCTS FOLLOWING HARVEST (5). LEC. 3, LAB. 4.** Pr., BY 306, graduate standing. Summer, even years. Physiological changes occurring in fresh fruits, vegetables, and other horticultural plant products after harvest. Methods of studying these changes and factors influencing them.
607. **BREEDING OF HORTICULTURAL CROPS (5). LEC. 3, LAB. 4.** Pr., ZY 300, graduate standing. Summer, odd years. An application of genetic principles in the propagation and maintenance of fruit, vegetable, and ornamental crop varieties. The genetic basis of some production problems, and special breeding methods applicable to horticultural crops.
699. **RESEARCH AND THESIS. CREDIT TO BE ARRANGED.** May be taken more than one quarter.

Industrial Design (IND)

Professors Pfeil and Schaefer
Associate Professor Bullock, *Head*
Instructor Rake

210. **INDUSTRIAL DESIGN (6). LEC. 2, LAB. 12.** Pr., sophomore standing. (2.00 overall). Visual communication. Perception theory; design fundamentals; color, figure organization, movement and balance, proportion and rhythm.
211. **INDUSTRIAL DESIGN (6). LEC. 2, LAB. 12.** Pr., IND 210 and COI. An extension of principles encountered in Industrial Design 210. A study and analysis of Industrial Design Fundamentals.
212. **INDUSTRIAL DESIGN (6). LEC. 2, LAB. 12.** Pr., IND 211 and COI. Structural and functional relationship of design elements; convenience, utility, safety, maintenance.
221. **MATERIALS & TECHNOLOGY (5). LEC. 5.** Pr., sophomore standing. The properties and use of various materials in manufacture and a study of the machine and tool processes used by industry. Survey from the Designer's viewpoint.
222. **TECHNICAL ILLUSTRATION (5). LEC. 5.** Pr., sophomore standing. Pictorial drawing, and freehand graphics as used by Industrial Designers.
223. **INDUSTRIAL DESIGN METHODS (5). LEC. 5.** Pr., sophomore standing. The methods and organizational procedures employed in the analysis and solutions of design problems. Survey of philosophies and theories of design.
307. **ANTHROPOMETRY (5). LEC. 5.** Pr., IND 222, 223, 311, TS 105. Survey and Introduction to the field of body measurements and movements in relation to Design.
308. **DESIGN WORKSHOP (5). LEC. 3, LAB. 6.** Pr., IND 210, TS 111. Modelmaking and creative modeling. Study Models, Presentation Models, Mock-ups, Prototypes.
309. **DESIGN COMMUNICATION (5). LEC. 5.** Pr., IND 222. Experiments in visual thinking and modeling.
310. **INDUSTRIAL DESIGN (6). LEC. 2, LAB. 12.** Pr., IND 212, 221, 222, 223, TS 105. (2.00 overall and 2.33 from IND 210, 211, 212.) Packaging, trademark and corporate identity programs. Exhibition and display fixtures.
311. **INDUSTRIAL DESIGN (6). LEC. 2, LAB. 12.** Pr., IND 221, 310. Product design utilizing principles of design methodology from idea stages through working models.
312. **INDUSTRIAL DESIGN (6). LEC. 2, LAB. 12.** Pr., IND 311. Emphasis on concept development using drawing and rendering skills for idea communication and presentation.
410. **INDUSTRIAL DESIGN (6). LEC. 2, LAB. 12.** Pr., IND 312, 307, 308, 309. Industrialized building. Housing systems produced by industrial means.
411. **INDUSTRIAL DESIGN (6). LEC. 2, LAB. 12.** Pr., IND 410. (2.25 overall and 2.50 from IND 310, 311, 312, 410.) Design or re-design of products and systems of advanced complexity.
412. **INDUSTRIAL DESIGN THESIS (6). LEC. 2, LAB. 12.** Pr., IND 411. A project involving all design phases; project of the student's own selection and approved by the instructor. Presentation of graphics, models and written explanations, and oral presentation before a Design Jury. Thesis material may be retained by the Department for one year.
415. **HISTORY OF INDUSTRIAL DESIGN I (5). Pr., IND 212.** Design from the first Industrial Revolution to the present with emphasis on the relation between design and science, art, technology, and the humanities.

ADVANCED UNDERGRADUATE AND GRADUATE

516. **HISTORY OF INDUSTRIAL DESIGN II (5). LEC. 5.** Design from the beginning of artifacts to the first Industrial Revolution, with emphasis on the relation between design and sciences, art, technology, and the humanities.
585. **SEMINAR IN INDUSTRIAL DESIGN (5). LEC. 5.** Pr., 4th year standing. Development of individual projects. Research, design, reports, on approved topics. May be repeated for a maximum of ten hours.
586. **CASE STUDIES IN DESIGN (5). LEC. 3, LAB. 6.** Design projects undertaken by industry will be studied by examination of artifacts and records, by interviews with professionals responsible for the phases of the projects, and by class discussions of this data and its implication. Focus on the socio-cultural relevancy of the artifacts.

GRADUATE

Individual courses available to graduate students in other fields

- 601-602. PRINCIPLES OF DESIGN (5-5). LEC. 2, LAB. 9.** The communication principles of form qualities, with emphasis of these principles to the technical and human factors of artifacts, and to the human visual environment.
- 605. DESIGN MANAGEMENT (5). LEC. 3, LAB. 6.** The Industrial Design project management and development with emphasis on the interrelational management concepts of research, product planning, production and marketing.
- 606. HUMAN FACTORS IN DESIGN (5). LEC. 3, LAB. 6.** A theoretical and empirical examination of human factors (anthropometrics, Biotechnology, Engineering Psychology, Behavioral Cybernetics, Ergonomics) as applied to man-machine environment systems.
- 608-609. AESTHETICS IN DESIGN (5-5). LEC. 3, LAB. 6.** Aesthetics in the context of the designed environment encompassing such topics as: Non-verbal communication, object language and semiotics, gestalt and perception systems; information aesthetics and consumer product safety.
- 610. DESIGN THEORIES (5). LEC. 3, LAB. 6.** An examination of Design Theories and Philosophies as related to technical artifacts in man-machine systems. Comparative studies of unifying theories in Art, Science, Design, Technology and the Humanities.
- 611-612. DESIGN METHODOLOGY (5-5). LEC. 3, LAB. 6.** Industrial Design methodologies and scientific methods employed in research, analysis, synthesis and evaluation in comprehensive design problems. Emphasis on creativity and innovation.
- 613-614. SYSTEMS DESIGN (5-5). LEC. 2, LAB. 9.** Systems approach and interdisciplinary team work to Design problems, inquiries into details of sub-systems, components, and parts, with emphasis on the relation of the performance of technical systems to optimal human factor effects.
- 620-621-622-623. INDUSTRIAL DESIGN (5-5-5-5). LEC. 1, LAB. 12.** Synthesizing studies in research, analysis and application based on an interdisciplinary concept. The project content is according to the student's interest from one or several of the following design areas: Product Design, Industrialized Housing, Package Design, Corporate Communications, Transportation Design, Exhibition Design and Systems Implementation. Emphasis on the relation of products and systems to those who use them.
- 699. RESEARCH AND THESIS. CREDIT TO BE ARRANGED.** May be taken more than one quarter.

Industrial Engineering (IE)

Professors Unger, Head, Brooks, Brown, Cox, and Hool

Associate Professors Bulfin, Herring, Layfield, Maghsoodloo, Smith, Trucks, Webster, and White

Assistant Professors Boyd, Hines, and Park

- 202. INDUSTRIAL ENGINEERING FUNDAMENTALS (3).** Introduction to the fundamentals of tools and techniques used in the practice of industrial engineering. The relationships of the sub-disciplines of industrial engineering to the current curriculum and typically encountered problems are explored. Introduction to computer programming and the FORTRAN programming language.
- 300. COMPUTER PROGRAMMING AND INTRODUCTION TO INFORMATION-DECISION SYSTEMS (3). LEC. 2, LAB. 3.** Pr., an introductory knowledge of FORTRAN, MH 264 or concurrently. Intermediate computer programming using the FORTRAN programming language with emphasis on mathematical and engineering problems. Included are introductory design considerations for information-decision systems involving computers as a principal data processing device. (Intended primarily for engineering students and not open to students with credit in IE 204.)
- 301. INFORMATION RETRIEVAL AND COMPUTER PROGRAMMING (3). LEC. 2, LAB. 3.** Pr., IE 202, or 204, or knowledge of a computer language. An introduction to digital computer programming with emphasis on information retrieval problems using COBOL programming language.
- 305. INFORMATION-DECISION SYSTEMS (3). LEC. 2, LAB. 3.** Pr., IE 300. Interrelated components of complex management information-decision systems. Design considerations for systems involving computers as a principle data processing device.
- 308. ERGONOMICS I (4). LEC. 3, LAB. 3.** The analysis and design of work places and methods through application of ergonomic and methods engineering principles.
- 311. ENGINEERING STATISTICS I (3).** Pr., MH 264. Basic probability, random variables and distribution functions.
- 323. ENGINEERING STATISTICS II (5).** Pr., IE 311. Distribution functions, tests of hypotheses, estimation, regression and correlation methods and introduction to analysis of variance.
- 327. ENGINEERING ECONOMIC ANALYSIS (5). LEC. 4, LAB. 3.** Pr., MH 265, EC 200, or equivalent or concurrently. The development of principles required in engineering economy studies and other decision-making oriented courses. Topics include interest and interest formula derivations, economic decision criteria, capital budgeting, depreciation methods, tax considerations and cost accounting, economic analysis of the selection and replacement of structures, equipment, processes and methods, break-even analysis and learning curves.

333. **ENGINEERING STATISTICS III (4).** Pr., IE 323. Continuation of IE 323. Included are two-way analysis of variance, χ^2 goodness-of-fit, and statistical quality control. Emphasis is on quality control.
335. **LINEAR PROGRAMMING (4).** Pr., MH 163. Introduction to linear programming with emphasis on model formulation and solution. Other topics include matrix algebra applied to systems of linear equations, computer solutions, and optimality analysis.
384. **DATA STRUCTURES (3).** Pr., IE 204 or equivalent. Basic concepts of data. Linear lists, strings, arrays, and orthogonal lists. Representation of trees and graphs. Storage structures, allocation, and collection. Multilinked structures. Symbol Tables and searching techniques. Sorting techniques, and generalized data management systems.
385. **COMPUTER PROGRAMMING SYSTEMS I (3).** Pr., IE 204 or 300. An introduction to the types, relationships, and uses made of computer languages which are grouped under the general name of software, with emphasis on utilities, operating systems, and specialized programming languages.
408. **ERGONOMICS II (5). LEC. 4, LAB. 3.** Pr., IE 308, 323. The assessment of human work performance and the establishment of performance standards.
415. **OPERATIONS RESEARCH MODELS (5).** Pr., IE 300, 323, 335. An introduction to operations research and some operations research models. Topics include the concepts of systems design, analysis and optimization, network models, introductory dynamic programming, game theory, queueing theory and an introduction to inventory theory, decision theory or Markov Chains.
416. **SIMULATION (3).** Pr., IE 305, 323. Simulation procedures for solving complex systems analysis problems. Emphasis on random processes, model building, and construction of computer simulation models.
422. **PRODUCTION CONTROL FUNCTIONS I (4).** Pr., IE 327, 408 or concurrently. Functions of production control; forecasting; inventory analysis; scheduling; dispatching and progress control.
425. **PRODUCTION CONTROL FUNCTIONS II (3).** Pr., IE 422, 427 or concurrently. Functions of production control; production planning; line balancing; plant location; plant layout; manufacturing processes.
427. **OPERATIONS AND FACILITIES DESIGN I (3). LEC. 2, LAB. 3.** Pr., IE 327. Design principles and concepts of complex systems. (Should be taken the quarter immediately prior to the taking of IE 428.)
428. **OPERATIONS AND FACILITIES DESIGN II (3). LAB. 9.** Pr., IE 415, 424, 427. The design of industrial, institutional, governmental and service operations and facilities. (Should be taken during student's final quarter.)
436. **PLANT LOCATION (3).** Pr., IE 335, 327, 415. Factors and techniques pertinent to the economic location of industrial plants.
438. **OCCUPATIONAL SAFETY AND HEALTH ENGINEERING (5).** Pr., COI, or senior standing. Occupational safety and health problems with emphasis on the role of the industrial engineer in the elimination of physical and environmental hazards.
- 490-491-492. **INDUSTRIAL ENGINEERING PROBLEMS (1-5).** Pr., COI and department head approval. Individual student endeavor under staff supervision involving special problems of an advanced nature in Industrial Engineering.

Courses Not Open to IE Majors

201. **INDUSTRIAL ADMINISTRATION (3).** Pr., sophomore standing. The concepts, techniques, and functions of engineering management.
204. **COMPUTER PROGRAMMING (3).** Pr., MH 151 or 161. Digital computer programming with emphasis on mathematical problems, using FORTRAN programming language. (Not open to students with credit in IE 300.)
220. **APPLIED STATISTICS (5).** Pr., MH 161. Introduction to probability and statistical methods including descriptive statistics, probability and probability distributions, sampling, estimation, regression, time series, index numbers, ranking, and analysis of variance. Applications to administrative and production-service functions will be emphasized.
302. **PRODUCTION CONTROL TECHNIQUES (3).** Pr., IE 201 or MH 310. Planning, scheduling, routing, and dispatching in manufacturing operations. Mechanisms for production control.
310. **MOTION AND TIME STUDY (5). LEC. 4, LAB. 3.** Pr., IE 220 or EC 274. Principles and practices of methods engineering and time study.
316. **ELECTRONIC DATA PROCESSING SYSTEMS DESIGN (4). LEC. 3, LAB. 3.** Pr., IE 204 or 300 or 301 or equivalent programming capability. Application of computer and associated data processing equipment to business and administrative and decision systems design.
320. **ENGINEERING ECONOMY (5).** Pr., MH 161, junior standing. Practical engineering studies for the economic selection of structures, equipment, processes and methods. (Not open to students with credit in IE 327.)
330. **DECISION ANALYSIS (5).** Pr., IE 220 or equivalent. A quantitative analysis of the decision-making process involving models of certainty, risk, and uncertainty with applications to marketing, production, and administration. (Not open to engineering students.)
410. **ENGINEERING STATISTICS (5).** Pr., MH 264 or COI. Basic probability, random variables, discrete and continuous distributions, sampling distributions, hypothesis testing, estimation, regression and correlation, one-way analysis of variance, testing goodness of fit. (Not open to students with credit in IE 311.)

411. **OPERATIONS RESEARCH (5).** Pr., MH 266, IE 410 or equivalent or concurrently. Model construction, linear programming, network models, dynamic models, stochastic models, queueing theory, decision theory and simulation. (Not open to students with credit in IE 415.)

ADVANCED UNDERGRADUATE AND GRADUATE COURSES

502. **SYSTEMS ANALYSIS FOR SAFETY (3).** Pr., IE 311 or 410 or COI. Problem identification, evaluation of safety performance, cost-benefit and optimization techniques. Fault free analysis, system safety and reliability.
508. **HUMAN FACTORS ENGINEERING (5).** Pr., PG 211 or 212 or COI. Human factors engineering in systems design including applied anthropometry, work place design; assessment of work, noise and heat stress; and equipment design. (Not open to students with credit in IE 408.)
515. **SENSITIVITY ANALYSIS IN OPERATIONS RESEARCH MODELING (3).** Pr., IE 415, and 416 and 422 or the equivalent, or COI. An investigation of how an operations research model's decisions and returns change with respect to changes in model parameters and characteristics. Several types of models are considered, and examples are presented.
540. **SAMPLING AND SURVEY TECHNIQUES (3).** Pr., IE 323. Theory and application of statistical sampling and survey methods, with emphasis on methods optimization.
541. **APPLIED INDUSTRIAL ENGINEERING MATHEMATICS (3).** Pr., MH 265. Formulation and solution of differential and difference equations. Solution techniques will include analytical theory, Laplace and Z transforms and computer techniques. Introduction to state variables, matrix algebra and analysis.
542. **ADVANCED LINEAR PROGRAMMING (3).** Pr., IE 335. Continuation of IE 335 with emphasis on theory. Revised simplex, dual simplex, parametric programming, decomposition, and applied problems.
543. **INVENTORY CONTROL (3).** Pr., IE 333, 415, 422. Application of quantitative methods to the control of industrial inventories.
550. **SEARCH METHODS FOR OPTIMIZATION (3).** Pr., MH 264 or COI and senior standing. Single and multivariate search techniques and strategies which are used in finding the optimum of discrete or continuous functions about which full knowledge is not available.
553. **DYNAMIC PROGRAMMING (3).** Pr., MH 264. The theory and methods of dynamic programming will be presented. Specific applications will be discussed.
555. **ADVANCED COMPUTER PROGRAMMING (3).** Pr., IE 204 or 300 or COI. Formal definition and presentation of numeric and nonnumeric problems with solutions in the programming language PL/I.
556. **INTERMEDIATE SIMULATION (3).** Pr., IE 416, junior standing. Intermediate simulation techniques including an in-depth study of a simulation language.
558. **RELIABILITY ENGINEERING (3).** Pr., IE 333, 415. Reliability, maintenance, and replacement, with emphasis on quantitatively descriptive methods to be used for problem solving.
559. **OPERATIONAL CONTROL SYSTEM DESIGN (3).** Pr., IE 425. The design of operational planning and control systems. Integration of individual systems functions. Concept of total systems optimization.
560. **MATERIALS HANDLING SYSTEMS (3).** Pr., IE 415, 416. Quantitative analysis and design of material handling systems. Quantitative methods and case studies.
561. **ADVANCED FACILITIES DESIGN (3).** Pr., COI. Quantitative methods used to design production and service facilities are emphasized. Case studies.
564. **ERGONOMICS III (3).** Pr., IE 408 or COI, senior standing. The philosophy and techniques of man-machine systems design. Emphasis is placed on proper integration of man into production systems.
566. **INDUSTRIAL MAINTENANCE ENGINEERING (3).** Pr., IE 305, 422 or COI. Industrial maintenance and organization including planning and scheduling, motivation, inspection, preventive maintenance, replacement, data processing and relation to other areas.
570. **SCHEDULING: THEORY AND APPLICATIONS (3).** Pr., IE 411 or 415 or COI. Network based sequencing and scheduling problems. Numerous algorithms are presented for scheduling facilities to achieve one or more of several desirable objectives within precedence and resource constraints. Scheduling areas discussed include projects, assembly lines, flow shops and job shops.
571. **CONTINUOUS PROCESS CONTROL AND DYNAMICS (3).** Pr., IE 541. Continuous process dynamics and block diagram formulation. Conventional continuous process control and introduction to advanced control topics.
572. **ENGINEERING OF ORGANIZATION AND MANAGEMENT (3).** Pr., COI, senior standing. Organizational theory and concepts; the interaction between the individual and the organization.
575. **PROJECT MANAGEMENT (3).** Pr., IE 411 or 415 or COI. Project management and development with primary emphasis on use of operations research methods and cost analysis. Study of the applications of CPM, PERT, and GERT to project management.
580. **DATA PROCESSING FUNDAMENTALS (5).** Pr., COI. An introduction to business data processing methods and procedures, hardware (primarily electro-mechanical and electronic), and software. Introductory programming using the COBOL language emphasizing business applications. (Not for science and mathematics students.)
585. **COMPUTER PROGRAMMING SYSTEMS II (3).** Pr., IE 385. An introduction to machine-oriented programming systems for digital computers. Emphasis will be placed upon the Assemble Language/360 as well as macro systems and input-output control systems.

- 586. INFORMATION ORGANIZATION AND RETRIEVAL (3).** Pr., IE 305, 385, and 301 or 555. The analysis of information content by statistical, syntactic, and logical methods. Search strategies, matching techniques, and file organization in practical retrieval systems. Evaluation of retrieval effectiveness.
- 587. FORMAL THEORY OF COMPUTER LANGUAGES (3).** Pr., IE 301, 555, 585 or COI. Detailed mathematical models of programming languages; phrase structure languages, particularly context-free languages, and their syntactic analysis with application to translation. An introduction to the principles of compilers.
- 588. FUNDAMENTAL ALGORITHMS (3).** Pr., IE 384, 555, 585. An introduction and analysis of algorithms commonly used by computer scientists. Topics include generating functions, sub-routines, coroutines, linear lists, trees, and multilinked structures.
- 589. ADVANCED DATA PROCESSING (3).** Pr., IE 384, 555 and 589 or equivalent concepts. Advanced concepts of data processing and information system design using the programming language PL/I.

GRADUATE

- 616. INDUSTRIAL DYNAMICS (3).** Pr., IE 416 or COI. Industrial dynamics based on a systems approach to industrial and related problems, with emphasis on decision-making.
- 617. ADVANCED SIMULATION PROBLEMS (3).** Pr., IE 416 or COI. Journal readings of applications simulation and development of procedure to solve large scale, realistic simulation problems.
- 620. ADVANCED ENGINEERING ECONOMY (3).** Pr., IE 327 or COI. Engineering and economic aspects of project design and analysis. Advanced treatment is given to the following topics: capital budgeting, financing manufacturing organizations, risk and sensitivity analysis, mathematical programming approach to investment decisions, and forecasting methods including input-output analysis.
- 621. MARKOV CHAINS (3).** Pr., IE 415. Finite and continuous Markov Chains, Poisson and Wiener processes, applications will be discussed.
- 622. QUEUEING THEORY (3).** Pr., IE 323 or 410, MH 621, or COI. Mathematical models of queueing, with applications to problems such as materials flow, inventory policy, and service center design. Simulation solutions to queueing networks are considered.
- 623. TIME SERIES (3).** Pr., IE 415. Stationary stochastic processes, time series analysis with emphasis on spectral density functions and applications will be discussed.
- 624. INVENTORY AND PRODUCTION CONTROL SYSTEMS (3).** Pr., IE 425. Advanced topics in production control and inventory theory. The relationships between production and inventory will be discussed.
- 625. ADVANCED SCHEDULING THEORY (3).** Pr., IE 570. A survey of models and methodologies in the areas of sequencing and scheduling are presented. Models covered include: the single processor model, parallel processor model, flow shops and job shops. Methodologies covered include: integer and dynamic programming, branch and bound and other enumeration procedures as well as simulation and sampling and search methods.
- 630. ADVANCED STATISTICAL METHODS FOR ENGINEERS I (3).** Pr., IE 323 or equivalent. Basic concepts of statistical experimental design including randomization methods, analysis of variance methods, mathematical derivation of expected mean squares multiple comparison tests, and the Bennett and Franklin algorithm.
- 631. ADVANCED STATISTICAL METHODS FOR ENGINEERS II (3).** Pr., IE 630 or COI. Extension of IE 630, with primary emphasis on analysis of variance methods.
- 632. ADVANCED STATISTICAL METHODS FOR ENGINEERS III (3).** Pr., IE 630 or COI. Elaboration of basic statistical methods for engineers, with emphasis on a more theoretical study of multiple linear regression and the optimization of multiple linear regression methods.
- 634. NON-LINEAR PROGRAMMING (3).** Pr., IE 542. This course covers quadratic programming, separable programming, gradient methods, and integer programming.
- 640. NONPARAMETRIC STATISTICS (3).** Pr., IE 323. The theory and application of several nonparametric and distribution-free statistical methods with emphasis on engineering applications.
- 642. INPUT-OUTPUT ANALYSIS (3).** Pr., IE 542 or COI. Input-Output analysis for interindustry, industry, and company study. Computational aspects of large scale models. Case studies.
- 644. OPTIMIZATION THEORY FOR LARGE SYSTEMS (3).** Pr., IE 634 or COI. Large problems with special structures: decomposition principle, many column problems, relaxation procedures, in linear programming, generalized upper bounding, partitioning procedures, and applications.
- 653. ADVANCED DYNAMIC PROGRAMMING (3).** Pr., IE 553. Advanced topics in the theory and application of dynamic programming. Numerical methods to solve specific types of problems. Case studies.
- 661. QUEUEING APPLICATIONS (3).** Pr., IE 622 or COI. Computer-communication networks based upon queueing theory.
- 663. DECISION AND GAME THEORY (3).** Pr., IE 323 or 410 or COI. Classification of decision problems, Bayes risk, utility theory and its applications, optimal strategies for rectangular games, and use of linear programming in solving zero-sum games.
- 664. MANAGEMENT INFORMATION DECISION SYSTEMS (3).** Pr., COI. Analysis of organizations for information requirements, information flow, data storage and usage and total information systems.
- 665. ADVANCED TOPICS IN HUMAN ENGINEERING (3).** Pr., IE 564. Human information processing with particular emphasis on human decision behavior.

- 670. ADVANCED COMPUTATION METHODS (3).** Pr., COI. Advanced computer languages, pattern recognition, and hybrid computation. This course is designed to keep the graduate student abreast of current ideas in this rapidly expanding field.
- 671. DISCRETE PROCESS CONTROL AND DYNAMICS (3).** Pr., IE 571. Sampled-data control systems and computer control topics. Representation of discrete industrial processes.
- 672. FUNCTIONAL OPTIMIZATION THEORY (3).** Pr., IE 415. Introduction to functional optimization theory including min-max theory, calculus of variations, pontryagin, maximum principles and applied functional analysis.
- 675. ADVANCED OPERATING SYSTEMS DESIGN (3).** Pr., IE 301, 555, 585, or COI. Advanced software design methodology with applications focusing on computer operating systems.
- 676. TELEPROCESSING SYSTEMS SOFTWARE (3).** Pr., IE 622. An introduction to the theory and methods used in developing telecommunication systems software.
- 680. ADVANCED TOPICS IN OCCUPATIONAL SAFETY AND HEALTH (3).** Pr., IE 438 or equivalent. Coreq., IE 631 and 665, or COI. Selected topics including accident proneness, risk taking, and systems safety are pursued at the advanced level. Quantification and modeling are emphasized.
- 687. FORMAL THEORY OF COMPUTER LANGUAGES II (3).** Pr., IE 587 or COI. An in-depth study of compiler principles including symbol tables, source and object program optimization, semantic analysis, storage organization, and code generation.
- 688. METHODS OF SORTING AND SEARCHING (3).** Pr., IE 588 or COI. An introduction to the theoretical and practical aspects of searching and sorting via the digital computer. Study of algorithms necessary to create and optimize a sort or search routine.
- 690-691-692. INDUSTRIAL ENGINEERING PROJECTS (1-5).** Pr., COI and department head approval. Individual student endeavor under staff supervision involving special problems of an advanced nature in Industrial Engineering.
- 696. SEMINAR (1).** Pr., IE Graduate Student Standing. S-U only. Presentation and discussion of current I.E. research activities by students, faculty, and guests.
- 698. M.I.E. DESIGN PROJECT. CREDIT TO BE ARRANGED.** May be taken more than one quarter.
- 699. RESEARCH AND THESIS. CREDIT TO BE ARRANGED.** May be taken more than one quarter.
- 799. RESEARCH AND DISSERTATION. CREDIT TO BE ARRANGED.** May be taken more than one quarter.

Interdepartmental Education (IED)

Included in this section are program areas and course listings designed and taught on the interdepartmental basis. The subheadings reflect the nature and scope of the offerings.

- 101. CAREER EXPLORATION AND PLANNING (1).** LEC. 1. Helps undeclared freshmen in planning their professional careers.

Twelve-Grade Certification Programs

Art, Theatre, and Speech Communication (IED)

Each of the following courses may be taken as: (A) Art, (C) Theatre, and (M) Speech Communication.

- 414. TEACHING IN ELEMENTARY AND SECONDARY SCHOOLS (3).** LEC. 2, LAB. 2. Pr., FED 350 or equivalent. Admission to Teacher Education.
- 423. PROGRAM IN ELEMENTARY AND SECONDARY SCHOOLS (3).** LEC. 2, LAB. 2. Pr., FED 350 or equivalent. Admission to Teacher Education.
- 425. PROFESSIONAL INTERNSHIP (15).** Pr., senior standing, admission to Teacher Education prior to Internship, appropriate professional courses. Provides supervised, on-the-job experiences in a school, college, or other appropriate setting. These experiences will be accompanied by regularly scheduled discussion periods designed to provide positive evaluation and analysis of the intern experience.

GRADUATE

- 625. INTERNSHIP (5-15).** Provides advanced students with supervised, on the job experiences in a school or college or other appropriate setting. These experiences will be accompanied by regularly scheduled on-campus discussion periods designed to provide positive evaluation and analysis of the intern experience.
- 646. DIRECTED INDEPENDENT STUDY (1-6).** Special study in which the student's learning efforts are guided toward desired objectives. Includes evaluation by professor and student at regular intervals.
- 650. SEMINAR IN AREAS OF SPECIALIZATION (3-10).** May be repeated for credit not to exceed 10 hours. Provides an opportunity for advanced graduate students and professors to pursue cooperatively selected concepts and theoretical formulations.

651. **RESEARCH STUDIES IN EDUCATION IN AREAS OF SPECIALIZATION (5).** Review, analysis, and interpretation of available research with emphasis on designing new research to meet the changing needs of the school.
652. **CURRICULUM AND TEACHING IN AREAS OF SPECIALIZATION (5).** Teaching practices and reappraisal of selecting experiences and content for curriculum improvement.
653. **ORGANIZATION OF PROGRAM IN AREAS OF SPECIALIZATION (5).** Program organization, and development of basic and supplementary materials for guiding teachers, faculties, and school systems in the continuous improvement of curriculum and teaching practices.
654. **EVALUATION OF PROGRAM IN AREAS OF SPECIALIZATION (5).** Evaluation and investigation of teaching effectiveness with attention also given to the utilization of human material resources and the coordination of areas of specialization.

Prerequisites for the 651, 652, 653, and 654 courses are 18 hours of appropriate subject matter and 36 hours of psychology and professional education.

Other Interdepartmental Education Courses (IED)

Curriculum and Teaching

GRADUATE

646. **ADVANCED STUDY OF CURRICULUM AND TEACHING (5).** Pr., FED 647 or COI. Major issues, frontier developments, and trends in the improvement of curriculum and teaching in elementary and secondary schools.
658. **SEMINAR AND INDEPENDENT STUDY IN CURRICULUM AND TEACHING (5).** Pr., FED 647 and IED 648 or COI. Research and experimentation in elementary and secondary schools in the development of education programs and the improvement of teaching and learning. Appraisal of significant curriculum research, exploration of areas of needed research in curriculum and instruction, and study of fundamental criteria and methods for solving curriculum problems.

Community Education

GRADUATE

614. **IMPLEMENTING COMMUNITY EDUCATION CONCEPTS (5).** Integrating education within local institutions and socio-cultural movements. A review of strategies for implementing lifelong education services and for promoting a sense of community.

Alternative Residence

750. **ALTERNATIVE RESIDENCE SEMINAR (2-2-2).** Required of students in an alternative residence plan. These students must complete this three quarter sequence during the fall, winter, and spring quarters. Credit does not count toward minimum requirements for the Doctor of Education degree.

Professional Writing

517. **PROFESSIONAL WRITING IN EDUCATION (2).** Fundamentals of education discourse; strategies and techniques in educational writing; reference sources, the preparation of manuscripts for publication in professional journals.

GRADUATE

605. **PRACTICUM IN EDUCATIONAL ASSESSMENT AND PRESCRIPTIVE REPORT WRITING (5).**

Journalism (JM)

Professors Simms, Head, and Campbell
Associate Professors Brown and Logue
Assistant Professor Morgan

Freshman English is prerequisite for all journalism courses except JM 101.

101. **NEWSPAPER STYLE (3).** Required for all journalism majors and minors. The AP-UPI Stylebook and common errors in word selection in newspaper writing.
204. **INTRODUCTION TO PUBLIC RELATIONS (5).** The various communication skills and technologies for public relations will be explored. Credit for this course precludes credit for SC 204.
221. **BEGINNING NEWSWRITING (5).** Pr., JM 101; reasonable typewriting skills. Introduction to newswriting, newspaper style, and mechanical practice.
222. **NEWSPAPER LAB (1).** Pr., JM or PRJ major, JM 221. (S-U grading only). Student will work a minimum of 20 hours for *The Auburn Plainsman* in reporting, writing, editing or page makeup.

313. **REPORTING (5).** Pr., JM 221; reasonable typewriting skills. The technical aspects of reporting and newsgathering methods.
314. **COPYREADING AND EDITING (3).** Pr., JM 221. Methods of editing copy, writing headlines and proof reading.
315. **TECHNICAL JOURNALISM (3).** Not to be used for a major or minor in Journalism. Introduces practices of news coverage and writing.
321. **NEWSPAPER MAKEUP AND LAYOUT (5).** Pr., JM 221. Typography and design with practice applications in putting together newspaper pages.
322. **FEATURE WRITING (5).** Pr., JM 221 or COI. Gathering material for the writing of "human interest" and feature articles for newspapers and magazines, with consideration given to the marketing of manuscripts.
323. **THE COMMUNITY NEWSPAPER (5).** Pr., JM 221 and 321. Methods, problems, and policies involved in editing the community newspaper, as differing from the metropolitan daily.
355. **REPORTING OF POLITICAL AFFAIRS (3).** Pr., PO 210. Instruction and news assignments in political affairs. Credit in PO 355 precludes credit in JM 355.
421. **PHOTO-JOURNALISM (5).** Uses and processes of photography in the newspaper and magazine field. Operation of press cameras and the technique of developing, printing, and enlarging of pictures is provided.
- 422-423. **JOURNALISM WORKSHOP (3-3).** Pr., JM 313, 314, 321, 322, COI. A two-quarter course giving practical experience in preparation of newspaper, radio, television, and magazine copy through supervised work. The student is expected to work 10 hours per week.
425. **JOURNALISM INTERNSHIP (6).** Pr., JM 313, 314, 321, 322, COI. A full-time internship of at least ten weeks with an approved publication, serving as a regular staff member under the direction of the editor.
435. **MAGAZINE EDITING AND PRODUCTION (5).** Pr., JM 221. Methods and problems of publishing the popular and trade magazine.
465. **THE HISTORY AND PRINCIPLES OF JOURNALISM (5).** The development of the American Press, the principles and ideals of modern journalism, and the law of the press and radio.
475. **JOURNALISM SPECIAL STUDIES (1-5).** Pr., Departmental approval. Research and analysis of specific journalistic problems. Or lectures and seminars by visiting professional journalists.
485. **ADVANCED REPORTING (3).** Pr., JM 313, 314, 321, 322, COI. Developing and writing news stories under deadline pressure; investigative and interpretive reporting.
504. **PUBLIC RELATIONS CASE STUDIES AND PROBLEM SOLVING (5).** Pr., JM 204 or SC 204 or COI. Techniques in solving public relations problems. Credit for this course precludes credit for SC 504.

Laboratory Technology (LT)

Associate Professors Bridger, Davis, and Wheatley
Adjunct Associate Clinical Professors H. C. Elliott, C. B. Elliot, and Wert
Assistant Professor Kohl
Adjunct Clinical Instructors Hoots, Crider, Harrison, and Whaley

101. **ORIENTATION (1).** Fall, Winter. Aims, objectives, and requirements for careers in Medical and Laboratory Technology.
301. **HEMATOLOGY (5).** LEC. 3, LAB. 6. Study, procedures, and examinations of the blood, as recommended by the American Society of Clinical Pathologists.
401. **ADVANCED HEMATOLOGY (5).** LEC. 3, LAB. 6. Pr., LT 301. Advanced study of blood cells and blood dyscrasias.
404. **IMMUNOLOGY I (5).** LEC. 3, LAB. 4. Pr., BY 302, junior standing. Theory of immunology and techniques of laboratory tests based on the antigen-antibody reaction.
405. **IMMUNOLOGY II (5).** LEC. 3, LAB. 6. Pr., LT 404, junior standing. Theory and techniques of the serological study of human blood and lipid antigens.
422. **HOSPITAL LABORATORY PRACTICE (5).** LAB. 15. Pr., LT 301. Practice applications of the principles, procedures, and techniques encountered in hospital laboratories.
525. **CLINICAL LABORATORY INSTRUMENTATION (5).** LEC. 3, LAB. 6. Pr., CH 519 or 508 or COI. Theoretical and practical application of continuous flow analysis, atomic absorption spectrophotometry, radioimmunoassay and chromatographic techniques used in the analysis of body fluids.

Law Enforcement (LE)

Assistant Professors Kelly and Pendergast
Adjunct Assistant Professor G. H. Wright
Adjunct Instructor Abbett

260. **SURVEY OF LAW ENFORCEMENT (5).** Pr., sophomore standing. Introduction to the philosophical and historical backgrounds; agencies and processes; purposes and functions; administration and technical problems; career orientation. Credit for this course precludes credit for PO 260.

261. **CRIMINAL EVIDENCE (3).** Comprehensive analysis of the rules of evidence with particular emphasis on evidence obtained through search, seizure, and arrest.
262. **CRIMINAL INVESTIGATION (5).** Pr., sophomore standing. Criminal investigation procedures, including theory of investigation, case preparation, specific techniques for selected offenses, questioning of suspects and witnesses, and problems in criminal investigation.
270. **CAREER EXPLORATION AND PLANNING (2).** Pr., LE PO 260 and COI. (S-U grading only.) Career opportunities and demands. Offered all quarters for CJI and CJO. Offered only Fall and Winter quarters for CJI with orientation and participation prior to the quarter.
335. **CRIMINAL LAW FOR POLICE OFFICERS (3).** Pr., PO 209, 210, or LE PO 260. Statutory criminal law and criminal court procedures as applicable to the law enforcement function. Considers the impact of statutory law and common law on police procedures and policies. Judicial interpretation of criminal statutes and its relation to police policies are discussed and an analysis is presented of common police procedures, investigative techniques, and functions in the light of criminal and juvenile protective statutes.
361. **SURVEY OF CRIMINALISTICS (5).** Pr., LE 262, junior standing. Survey of scientific crime detection methods; crime scene search; identification and preservation of evidence; lie detection; *modus operandi*; fingerprint identification, and related subjects.
363. **POLICE ADMINISTRATION AND ORGANIZATION (5).** Pr., junior standing. Principles of organization and administration in law enforcement; functions and activities; planning and research; community relations; personnel and training; inspection and control; policy formulation.
461. **SEMINAR IN POLICE PROBLEMS (5).** Pr., LE 363 or 464.
464. **INTERNSHIP IN CRIMINAL JUSTICE (5-10).** Pr., consent of department head and junior standing. Internship in an approved law enforcement or correctional agency under supervision of the agency concerned. Written reports on internship required.

Management (MN)

Professors Henry, Head, Alexander, and Holley

Associate Professors Bedeian, Cox, Feild, Giles, Snow, and Stanford

Assistant Professors Adams, Blackstone, Bradbard, Davig,

Davis, Jesse, Lewis, Manz, McCollum, Mitra, Mossholder, Niebuhr, Norris,

Rucks, Schell, Snyder, and Wolters

207. **INTRODUCTION TO COMPUTER PROGRAMMING (3).** Pr., 10 hours math, sophomore standing. Introduction to the use of the computer as a tool in solving business problems, using an appropriate programming language in both a time shared and batch processing environment.
274. **BUSINESS AND ECONOMIC STATISTICS I (5).** Pr., MH 151 or equivalent, EC 200 or AEC 202 and MN 207. Frequency distribution and time series analysis; index numbers; probability; binomial and normal distributions; introduction to statistical inference.
307. **BUSINESS COMPUTER APPLICATIONS (3).** Pr., MN 207. Computerizing business applications using a current business language.
308. **BUSINESS DATA FILE STRUCTURES (3).** Pr., MN 307. Data base management techniques, file management techniques, and data structures.
310. **PRINCIPLES OF MANAGEMENT (4).** Pr., junior standing. Management functions and the application of management principles in organizations.
315. **PRINCIPLES OF SMALL BUSINESS MANAGEMENT (3).** Pr., MN 310 or COI. A comprehensive and integrated investigation of the principles underlying the successful creation and management of a small business.
346. **ORGANIZATION BEHAVIOR (4).** Pr., MN 310, junior standing. Human relations as applied to business organizations.
350. **MANAGEMENT OF CREATIVITY AND INNOVATION (3).** Pr., MN 310, MN 346, or COI. The environment of creative organizations and approaches to innovation in industry are employed along with the exploration of creative problem solving techniques.
374. **BUSINESS AND ECONOMIC STATISTICS II (5).** Pr., MN 274 or equivalent, junior standing. Probability distributions including the Poisson and "t" distributions; advanced time series analysis; chi square; multiple and partial correlation; statistical decision theory.
375. **NONPARAMETRIC STATISTICS (3).** Pr., MN 274. The analysis of business and economic data by distribution-free statistical methods.
380. **PRINCIPLES OF OPERATIONS MANAGEMENT (4).** Pr., MN 274, 310, junior standing. Modern scientific management as applied in the actual control and operation of industrial enterprises.
381. **MANAGEMENT DECISION MAKING (5).** Pr., MN 274, MN 207, 310, 10 hours of mathematics, junior standing. Various quantitative techniques as aids in managerial decision making under conditions of imperfect knowledge.
382. **MANAGEMENT INFORMATION SYSTEMS (4).** Pr., MN 207, 310, 380. Analysis and application of information flow in the business firm.

- 385. **PRODUCTION MANAGEMENT (5).** Pr., MN 380, junior standing. Application of management procedures and techniques to analyze and control product production methods and processes.
- 386. **MATERIALS MANAGEMENT I (3).** Pr., MN 380, junior standing. Application of management procedures and techniques to the acquisition, utilization, and distribution of materials in product manufacturing.
- 387. **MATERIALS MANAGEMENT II (3).** Pr., MN 386, junior standing. Continuation of MN 386, includes material requirements planning, capacity planning and control, and shop floor control.
- 399. **EXPERIENTIAL LEARNING IN VENTURE CREATION (5).** Pr., MN 315 or COI. The student acts as an adviser to a small business and prepares a plan for starting his/her own business. (Same as U399).
- 400. **STUDENT INTERNSHIP PROGRAM (1-10).** Pr., junior standing and selection by the committee directing the School of Business Intern Program.
- 410. **INTERNATIONAL BUSINESS MANAGEMENT (5).** Pr., EC 200, 202, MN 310, MT 331, ACF 361, junior standing. Management of multinational firm which owns subsidiaries in several countries.
- 415. **APPLIED SMALL BUSINESS ANALYSIS (3).** Pr., MN 315 or COI. A consulting opportunity which provides a test of the student's ability to apply skills and knowledge to the problems of an existing small business.
- 420. **APPLIED BUSINESS MANAGEMENT (5).** Pr., MN 310, junior standing. Application of management principles to develop pragmatic solutions for management problems selected from actual business situations.
- 440. **ORGANIZATION THEORY (5).** Pr., MN 346, junior standing. Organization theory and principles in the management of business operations.
- 442. **PERSONNEL MANAGEMENT (4).** Pr., MN 310, junior standing. Management of labor, dealing with selection, training, placement, turnover, payment policies, employee representation, etc.
- 447. **EMPLOYEE COMPENSATION (3).** Pr., MN 442, junior standing. Factors, philosophy, design, and problems of administration in compensation program.
- 455. **MERGERS AND ACQUISITIONS (5).** Pr., MN 480, ACF 466 or COI. Provides an understanding of the merger and acquisition process as part of the broader, general concept of organizational development and growth.
- 474. **QUALITY ASSURANCE (3).** Pr., MN 274, 380, junior standing. Fundamental concepts in quality assurance; tools and techniques necessary to carry out quality assurance functions; use of control charts and acceptance sampling plans.
- 475. **MULTICRITERIA DECISION MAKING (3).** Pr., MN 380, 381. Quantitative methods and their application in production and distribution problems of business.
- 480. **BUSINESS POLICIES AND ADMINISTRATION (5).** Pr., ACF 211, 212, 361, EC 200, 202, EH 415, MN 274, 310, 346, 382 or ACF 415, MT 255, 331, senior standing. Formulation and application of policies and programs pertaining to personnel, production, finance, procurement, and sales in the business enterprise.
- 484. **OPERATIONS MANAGEMENT (5).** Pr., ACF 213, 361, EH 415, MN 380, 381, 382, 385, 386, 387, MT 331. Capstone course for INM students. Application of material presented.
- 490. **SPECIAL PROBLEMS (1-10).** Pr., COI, junior standing. May be repeated. Investigation and research into problems with special interest for the student.
- 496. **READINGS IN MANAGEMENT (5).** Pr., MN 310, junior standing. Readings from prominent periodicals and journals in management theories, practices, and functions.

ADVANCED UNDERGRADUATE AND GRADUATE

- 541. **PERSONNEL AND ORGANIZATIONAL RESEARCH I (4).** Pr., MN 274 or equivalent, 442, junior standing. Methods used to bring about change in an organization.
- 545. **PERSONNEL AND ORGANIZATIONAL RESEARCH II (3).** Pr., MN 274 or PG 215 or equivalent, MN 346, 442, junior standing. Reading, analyzing, and conducting limited research studies in personnel and organizational problems.
- 550. **PERSONNEL SELECTION AND PLACEMENT (3).** Pr., MN 274 or PG 215 or equivalent, MN 442, junior standing. Factors involved in developing an effective system for selecting, classifying, and placing personnel.
- 551. **MANPOWER PLANNING, DEVELOPMENT, AND APPRAISAL (3).** Pr., MN 442, junior standing. Theory and practice plus design of managerial systems in these specialties.

GRADUATE

- 510. **THE PROCESS OF MANAGEMENT (5).** Pr., consent of Director of the MBA Program, School of Business. Accelerated course in management concepts, production functions and practices.
- 570. **FOUNDATIONS OF STATISTICS (4).** Pr., consent of the Director of the MBA Program, School of Business. An accelerated course designed to provide beginning MBA students with a foundation in statistical concepts, techniques and applications.
- 581. **DATA PROCESSING AND INFORMATION SYSTEMS (3).** Pr., consent of Director of the MBA Program, School of Business. Accelerated course in computer programming, data processing, and information systems.

- 600. COMPUTERS AND INFORMATION SYSTEMS IN MANAGEMENT (5).** Pr., MN 510, 581 or equivalent or COI. In-depth analysis of computing, data processing, information systems in complex organizations.
- 605. BEHAVIOR IN ORGANIZATIONS (5).** Pr., MN 510 or equivalent. Advanced study of human relations in individual group interactions within the environment of business organizations. Emphasis on research literature in the field.
- 606. MANAGEMENT PROBLEMS (5).** Pr., ACF 610, 663, EC 656, MN 605, 681 and MT 831. Basic administrative problems in business and industry. Managerial controls as applied to administrative and operative functions.
- 607. MANAGERIAL ECONOMICS (5).** Pr., completion of prerequisites for graduate study in Business or COI. Decision theory and criteria for decision-making concerning output, pricing, capital budgeting, scale of operations, investment and inventory control. Attention is also given to concepts of profits, production and cost functions.
- 608. HUMAN RESOURCE MANAGEMENT (5).** Pr., MN 442 or COI. Advanced personnel and human resource management.
- 610. MULTINATIONAL BUSINESS MANAGEMENT (5).** Pr., completion of prerequisites for graduate study in Business. Management of the multinational enterprise which engages in direct foreign investment.
- 640. ADVANCED ORGANIZATION THEORY (5).** Pr., MN 510. Traditional and contemporary organization theories with emphasis on current research and controversy.
- 649. OPERATIONS MANAGEMENT (5).** Pr., MN 510, 581. Detailed study of techniques related to capital investments, design and implementation of operating systems and management of production and inventory systems.
- 650. SEMINAR (1-10).** Pr., MN 510, 581, COI. For those students engaged in intensive study and analysis of management problems.
- 681. DETERMINISTIC QUANTITATIVE METHODS (3).** Pr., MN 581 or equivalent. (Same as ACF 681.) Deterministic quantitative methods for business applications.
- 682. STOCHASTIC QUANTITATIVE METHODS (3).** Pr., MN 581 or equivalent. (Same as ACF 682.) Various quantitative methods applied to management decision-making under conditions of risk and uncertainty.
- 690. SPECIAL PROBLEMS (1-5).** Pr., MN 510, 581 or equivalent, completion of 10 hours of 600-level management courses, and COI. Variable content in the management area.
- 696. READINGS IN MANAGEMENT (5).** Pr., MN 510. General management theories, practices, and functions in industry and business. Also, covers the role of personnel management and human relations.
- 699. RESEARCH AND THESIS. CREDIT TO BE ARRANGED.** Pr., COI.

Industrial Relations

ADVANCED UNDERGRADUATE AND GRADUATE

- 500. LABOR RELATIONS (5).** Pr., EC 200, junior standing. General survey of the development of collective bargaining, major provisions of labor law, and bargaining issues of craft and industrial unions.
- 501. LABOR RELATIONS LAW (5).** Pr., MN 500, junior standing. Analysis of background, content, and significance of industrial relations law.
- 502. LABOR-MANAGEMENT NEGOTIATION (3).** Pr., MN 500 or MN 501, junior standing. Bargaining issues, preparation for contract negotiation, and simulated bargaining sessions.
- 503. LABOR ARBITRATION (3).** Pr., MN 500 or MN 501, junior standing. Interest and grievance arbitration of Labor-Management issues. Case studies emphasized.
- 517. LABOR RELATIONS IN PUBLIC ORGANIZATIONS (3).** Pr., junior standing. The background, legal and constitutional aspects and management of group negotiations and collective bargaining in public employment. (Same as PO 517.)
- 546. PERSONNEL ADMINISTRATION LEGISLATION (3).** Pr., MN 442, junior standing. Legal aspects of personnel administration activities.
- 554. MULTI-NATIONAL NEGOTIATION AND INTERNATIONAL LABOR (3).** Pr., MN 500 or MN 501 or MN 410, junior standing. Variations among nations in the structure and government of trade unions, their political and religious ties, and other factors that influence multi-national bargaining. Emphasis on industrialized nations.

GRADUATE

- 644. COLLECTIVE BARGAINING AND ARBITRATION (5).** Pr., MN 500 or COI. The evolution and development of union-management relationships and the process of collective bargaining and arbitration.

Marketing and Transportation (MT)

Professors Baker, Head, Allen, Horton, and Lambert
Associate Professors Adams, Durand, Guffey, and Henley
Assistant Professors Daley, Harris, LaForge, Laumer,
Reese, Smith, and Stanton

Legal Environment

- 241. **BUSINESS LAW I (4).** Pr., sophomore standing. Introduction to law, torts, contracts, agency and personal property.
- 242. **BUSINESS LAW II (4).** Pr., MT 241. Legal principles concerning real property, sales, negotiable instruments, partnerships, and corporations.
- 255. **LEGAL AND SOCIAL ENVIRONMENT OF BUSINESS (4).** Legal and social environment for business operation with emphasis on contemporary issues.
- 344. **ENVIRONMENTAL LAW (4).** Pr., junior standing. Federal, State, and local law on conservation and regulation of environmental matters.

GRADUATE

- 605. **SOCIAL AND LEGAL ENVIRONMENT OF BUSINESS (3).** Pr., EC 501. The influence of the social, legal, political and economic environment on business.

Marketing

- 331. **PRINCIPLES OF MARKETING (5).** Pr., EC 202 and junior standing. A general survey of the field of marketing covering marketing channels, functions, methods and institutions.
- 332. **MARKETING COMMUNICATION MANAGEMENT (5).** Pr., MT 331, junior standing, not open to marketing majors. Credit cannot be received for both MT 332 and MT 432. An examination of the principles and applications of promotion in marketing.
- 333. **MERCHANDISING MANAGEMENT (5).** Pr., MT 331, junior standing, not open to marketing majors. Credit cannot be received for both MT 333 and MT 433. An examination and application of retail merchandising management concepts, principles, and fundamentals.
- 336. **QUANTITATIVE ANALYSIS IN MARKETING (5).** Pr., MN 207, 274, MT 331, MH 151, 161 and junior standing. An examination of the role of quantitative methods in implementing marketing strategy.
- 337. **FUNDAMENTALS OF SALESMANSHIP (5).** Pr., MT 331, 341 and junior standing. Knowledge and skill requirements for successful selling; the sales process; business and social responsibilities of salesmen.
- 341. **CONSUMER BEHAVIOR (5).** Pr., MT 331, PG 211, SY 201 and junior standing. Analysis of the consumer buying process as it is affected by environmental and institutional forces and development of market strategies which recognize these factors.
- 400. **STUDENT INTERNSHIP PROGRAM (1-10).** Pr., junior standing and selection by the committee directing the School of Business Intern Program.
- 432. **PROMOTIONAL STRATEGY (5).** Pr., MT 331, 336, 341, and junior standing. Problems of persuasive marketing strategy, promotional objectives, methods of implementing these objectives, and the approaches by which the methods might be blended.
- 433. **RETAIL STORE MANAGEMENT (5).** Pr., MT 331, 336, 341, ACF 212, and junior standing. Principles and practices in the scientific operation of the retail store. Store location, layout, buying, pricing, and merchandise control.
- 434. **PURCHASING (5).** Pr., MT 331; one from MT 336, 473, MN 381; junior standing. Objectives, control, and the direction of industrial purchasing.
- 436. **MARKETING RESEARCH METHODOLOGY (5).** Pr., MT 331, 336, 341, and junior standing. Methods of scientific research in the field of marketing and their application to the solution of marketing problems.
- 437. **SALES MANAGEMENT (5).** Pr., MT 331, 336, 341, and junior standing. Principles and practices of sound organization and administration of sales organization. Includes consideration of: sales department organization, selecting, training, compensating, and supervising sales planning, setting up sales territories and quotas.
- 438. **MARKETING CHANNEL SYSTEMS (5).** Pr., MT 331; MT 336 or 473; 341, junior standing. The nature and role of marketing channels. Major marketing strategy problems such as designing channel objectives and constraints, distinguishing major channel alternatives, and motivating, evaluating, and controlling channel members.
- 440. **INTERNATIONAL MARKETING (5).** Pr., MT 331, 341, completion of freshman math requirement, and junior standing. Adapting the marketing process of the domestic firm to international operations and the institutional structure that exists to service foreign markets and the practice of marketing administration by firms operating within these markets.
- 490. **SPECIAL PROBLEMS IN MARKETING (1-10).** Pr., MT 331 and senior standing. Qualified students conduct investigations of special problems in Marketing. (May be repeated for a maximum of 10 hours credit.)
- 496. **MARKETING STRATEGY (5).** Pr., MT 331, 336, 341, 436 and 10 additional hours of Marketing. An integrative capstone course for marketing majors.

ADVANCED UNDERGRADUATE AND GRADUATE

- 581. SPECIAL STUDIES IN MARKETING RESEARCH (5).** Pr., COI, MT 336, 341, 436; for graduate students, COI and MT 531 or equivalent. Specialized in-depth study and research projects within a particular subject area.
- 582. SPECIAL STUDIES IN RETAILING/MERCHANDISING (5).** Pr., COI, MT 336, 341, 433, 436; for graduate students, COI, and MT 531 or equivalent. Specialized in-depth study and research projects within a particular subject area.
- 583. SPECIAL STUDIES IN PROMOTION (5).** Pr., COI, MT 336, 341, 432, 436; for graduate students, COI, and MT 531 or equivalent. Specialized in-depth study and research projects within a particular subject area.

GRADUATE

- 531. SURVEY OF MARKETING MANAGEMENT (5).** Pr., consent of the Director of the MBA Program, School of Business and EC 501 or equivalent. An accelerated course in marketing concepts and practices.
- 631. MARKETING MANAGEMENT (5).** Pr., all foundation courses. In-depth analysis of concepts and techniques pertinent to executive decision-making in marketing.
- 632. MARKETING COMMUNICATIONS (5).** Pr., MT 631. A managerial perspective of the marketing communications process.
- 636. MARKETING RESEARCH: METHODOLOGY AND APPLICATIONS (5).** Pr., MN 570, MT 631. An examination of accepted marketing research techniques with emphasis on research design, implementation, and data analysis from the point of view of marketing management.
- 641. BUYER BEHAVIOR (5).** Pr., MT 631. In-depth analysis of the major psychological, sociological, and organizational behavior concepts involved in consumer and industrial buyer behavior.
- 690. SPECIAL PROBLEMS (1-5).** Variable content in marketing.
- 699. RESEARCH AND THESIS. CREDIT TO BE ARRANGED.**

Transportation

- 372. ECONOMICS OF TRANSPORTATION (5).** Pr., EC 200 and junior standing. The development of systems of transportation. Analysis of rates and their effects upon commerce and industry. Government regulation of transportation agencies.
- 400. STUDENT INTERNSHIP PROGRAM (1-10).** Pr., junior standing and selection by the committee directing the School of Business Intern Program.
- 473. PHYSICAL DISTRIBUTION MANAGEMENT (5).** Pr., MT 331 or 372 and junior standing. Fundamentals of physical distribution activities and their interrelationships in the management of the distribution process.
- 474. INDUSTRIAL TRAFFIC MANAGEMENT (5).** Pr., MT 372. Problems and policies involved in the traffic management function of the industrial firm.
- 475. TRANSPORTATION AND REGULATED INDUSTRIES (5).** Pr., MT 372 or COI and junior standing. Economic, legislative, and administrative problems related to regulation of transportation and utility rates and services.
- 476. TRANSPORT ENTERPRISE MANAGEMENT (5).** Pr., MT 372 or COI and junior standing. Problems and policies in the management and administration of transport enterprises of different modal types, primarily air, rail, and motor.
- 477. BUSINESS LOGISTICS (5).** Pr., MN 274, MT 372, 473. Problems and analysis in the design and management of logistics systems.
- 484. SPECIAL STUDIES IN TRANSPORTATION/LOGISTICS (5).** Pr., MT 372, and two from 473, 475, and 476. Specialized in-depth study and research projects within a particular subject area.
- 490. SPECIAL PROBLEMS IN TRANSPORTATION (1-10).** Pr., MT 372 and senior standing. Qualified students conduct investigations of special problems in Transportation. (May be repeated for a maximum of 10 hours credit.)

GRADUATE

- 671. LOGISTICS MANAGEMENT (5).** Pr., EC 501, MN 570 or their equivalents. Analysis of major logistics elements within the total system of the firm. A problem-oriented approach is employed in developing a managerial perspective.
- 672. TRANSPORT ECONOMICS AND PUBLIC POLICY (5).** Pr., EC 501 or equivalent. An examination of the U.S. transport system and an analysis of public policy issues regarding regulatory objectives and efficiency of resource use in transportation.
- 690. SPECIAL PROBLEMS (1-5).** Variable content in transportation.
- 699. RESEARCH AND THESIS. CREDIT TO BE ARRANGED.**

Materials Engineering (MTL)

Professors Jemian, *Chairman*, Budenstein, Hall, and Hsu
Associate Professors Slagh, and Wilcox
Assistant Professor Mathias

Responsibility for this curriculum, which is described on page 156, rests with the Interdisciplinary Materials Engineering Curriculum Committee. Questions should be directed to the Department of Mechanical Engineering which administers the program.

202. **ENGINEERING MATERIALS SCIENCE-STRUCTURE (3).** Pr., CH 103, PS 220 or 205. Theories and structures of crystalline and amorphous materials. Bonding, crystal classes, phase equilibrium relationships, diffusion and phase transformations. (Same course as ME 202.)
304. **ENGINEERING MATERIALS SCIENCE—PROPERTIES (3).** Pr., MTL 202, ME 207. Relationships between structure and properties and the effects of environment. Mechanical properties, plasticity of single and poly-crystals, and properties of composite materials. (Same course as ME 304.)
335. **ENGINEERING MATERIALS SCIENCE—PHYSICAL METALLURGY (4).** LEC. 3, LAB. 3. Pr., MTL 304. Relations between structure and properties of metals. Melting and solidification, crystal structure, dislocation and imperfection theories, alloying, deformation, and transformations. (Same course as ME 335.)
336. **PHYSICAL ANALYSIS OF MATERIALS I (4).** LEC. 3, LAB. 3. Pr., MTL 338. The analysis and interpretation of the structures of materials using optical techniques. Specific physical properties will be measured. Samples will be prepared and processed by the students. (Same course as ME 336.)
337. **PHYSICAL ANALYSIS OF MATERIALS II (4).** LEC. 3, LAB. 3. Pr., MTL 336, and ME 308. The analysis and interpretation of the structures and properties of materials using special techniques. Diffraction, radiography and various non-destructive test procedures will be employed. (Same course as ME 337.)
338. **PHASE DIAGRAMS (4).** LEC. 3, LAB. 3. Pr., MTL 335. Methods of representing and interpreting phase equilibria. Binary and multicomponent systems. Simpler temperature-compositions systems and more complex temperature-pressure-composition systems. Major emphasis on applications. Minor emphasis on phase diagram determination and thermodynamics. (Same course as ME 338.)
425. **THERMODYNAMICS OF MATERIALS SYSTEMS (4).** Pr., ME 301 and MTL 338. The laws of thermodynamics applied to the stability of materials phases, crystal imperfections, solubility, oxidation, surface and interfacial energy, and transformations. (Same course as ME 425.)
435. **PHYSICAL ANALYSIS OF MATERIALS III (4).** LEC. 3, LAB. 3. Pr., MTL 445, and MTL 337. The evaluation of microscopic structural features, anisotropic materials properties and the detection and interpretation of flaws. Microscopy, radiography and other non-destructive test methods will be employed. (Same course as ME 435.)
445. **TRANSFORMATIONS IN CONDENSED PHASES (4).** LEC. 3, LAB. 3. Pr., MTL 337, MTL 425, and MTL 336. Important transformations in both metallic and non-metallic materials with crystalline or glass structures. Structures, mechanisms, distinctive characteristics and applications will be studied. Selected transformations will be studied in the laboratory. (Same course as ME 445.)
446. **THEORETICAL MATERIALS ENGINEERING (3).** Pr., MTL 575, MTL 570, coreq., MTL 513. The physical properties of materials in relation to modern theories. (Same course as ME 446.)
447. **MECHANICS OF ENGINEERING MATERIALS (4).** LEC. 3, LAB. 3. Pr., MTL 516, and MTL 536. The mechanical properties in relation to structural features of alloys, plastics, ceramic materials and composites under static, dynamic and cyclic service and test conditions. Conditions for the attainment of optimum properties and behavior will be emphasized. (Same course as ME 447.)
448. **INTRODUCTION TO CERAMICS (3).** Pr., MTL 335, Coreq., MTL 445. The engineering applications and design principles of important ceramic materials will be studied with particular attention directed to the structure-property relationships. Both glassy and crystalline ceramic materials will be included. (Same as ME 448.)

ADVANCED UNDERGRADUATE AND GRADUATE

513. **INTRODUCTION TO X-RAY CRYSTALLOGRAPHY (5).** LEC. 4, LAB. 3. Pr., MTL 435. Principles of crystallography, the reciprocal lattice, theory of x-ray diffraction, and the powder, Laue, and diffractometer methods. (Same course as PS 513.)
515. **POLYMER TECHNOLOGY I (4).** LEC. 3, LAB. 3. Pr., CH 304 or CHE 560. Important aspects of polymer science, connection between chemical structure and important properties of modern plastics and synthetic structural materials, the common methods of fabrication of these into articles and the basic chemistry behind their manufacture. (Same course as CH 515.)
516. **POLYMER TECHNOLOGY II (3).** LEC. 3. Pr., MTL 515 or TE 424. Continuation of MTL 515. Study of polymerization and condensation polymers. Modes of fabrication, special use selection requirements, and study of a number of commercially available materials and their areas of use. (Same course as CH 516.)
536. **ENGINEERING MATERIALS SCIENCE-FERROUS METALLURGY (3).** Pr., MTL 335. Design of ferrous metals following modern theory and practice. Hardenability, alloying deformation, and special purpose steels. (Same course as ME 536.)
570. **ELECTRICAL PROPERTIES OF MATERIALS (3).** Pr., MTL 337, and EE 263. Studies of the electrical properties of materials with emphasis on semiconductors (Same course as EE 570.)

- 575. RATE PROCESSES IN MATERIALS (3).** Pr., CH 508, MTL 445, or COI and junior standing. Diffusion in the gas, liquid and solid phases and the fundamentals of chemical reaction kinetics pertinent to the crystallization and transformation of materials. (Same course as CHE 575.)

Mathematics (MH)

Hudson Professor Moise

Professors B. Fitzpatrick, Head, Ball, J. Brown, Burton, Butz, P. Fitzpatrick, Haynsworth, Heath, Hill, Hudson, Lindner, Reed, Rogers, Zenor
Associate Professors S. Brown, Day, Ford, Gruenhagen, Hinrichsen, Holmes, Kozlowski, K. Kuperberg, W. Kuperberg, Phillips, Robinson, Smith, Transue, Wall, Young, and Zalik
Assistant Professors Connor, Golightly, Grone, Hoffman, Jellett, P. Johnson, Mathis, Mekler, Moreman, Pate, Phelps, Pol, and Stuckwisch
Lecturer M. Fitzpatrick*
Instructors Bayne*, Bennett*, J. Brown*, Cobb*, Cohen, Fu, Fuller*, Guffey*, Hoveland*, G. Johnson, Litz*, May, Murphy, Tam

- 100. MATHEMATICAL INSIGHTS (5).** For students in the arts or humanities. The purpose of this course is to give such students insight into the nature of mathematics by engaging them in mathematical thought processes within a suitable elementary framework. Prior credit for any other University mathematics course precludes credit for this course.
- 140. COLLEGE ALGEBRA (5).** Pr., high school geometry, second year high school algebra or departmental approval. ** Algebraic techniques, coordinate geometry, functions and relations and their graphs, and common logarithms. A preparatory course for MH 151, MH 160 and MH 161. However, credit is not allowed for both MH 140 and MH 160.
- 151. FINITE MATHEMATICS (5).** Pr., MH 140 or 160. Selections from elementary combinatorial analysis, probability theory, linear algebra, linear programming. Designed for students in the School of Business and not open, except by special permission of the Department of Mathematics, to students in Engineering or to Mathematics or Physics majors.
- 155. ANALYTIC GEOMETRY (5).** Pr., MH 160 or equivalent. Plane and solid analytic geometry. Lines, planes, circles, spheres, vectors, conics, change of coordinates, polar coordinates, parametric equations, curve sketching.
- 160. PRE-CALCULUS WITH TRIGONOMETRY (5).** Pr., high school geometry, second year high school algebra or departmental approval. ** The basic analytic and geometric properties of the algebraic and trigonometric functions with heavy emphasis on the latter. A preparatory course for the calculus sequence. Students who need a review of algebraic techniques should take MH 140. However, credit is not allowed for both MH 140 and MH 160.
- 161. ANALYTIC GEOMETRY AND CALCULUS (5).** Pr., MH 140 or 160. Limits, the derivative, applications of the derivative, antiderivatives; the conic sections.
- 162-163. ANALYTIC GEOMETRY AND CALCULUS (5-5).** Pr., MH 160 and 161. Integrals, the fundamental theorem of calculus, applications of the integral, the calculus of the exponential and logarithmic functions. The calculus of the trigonometric and inverse trigonometric functions, techniques of integration, indeterminate forms, improper integrals.
- 171-172-173. CALCULUS LABORATORY (1-1-1).** Coreq., MH 161 for 171, MH 162 for 172, MH 163 for 173. Introduction to an elementary programming language. Computer evaluations of functions and limits, appropriate solutions of equations; approximate differentiation and integration.
- 174. CALCULUS LABORATORY (1).** Pr., MH 173 or ability to program in BASIC or FORTRAN. Coreq., MH 264. Numerical treatment of topics in MH 264.
- 191. ANALYTIC GEOMETRY AND CALCULUS IN CONJUNCTION WITH INTRODUCTORY PHYSICS (8).** Pr., MH 160. Plane and solid analytic geometry, real and vector valued functions, their derivatives and antiderivatives. The Fundamental Theorem of Calculus.
- 192. ANALYTIC GEOMETRY AND CALCULUS IN CONJUNCTION WITH INTRODUCTORY PHYSICS (4).** Pr., MH 191. Coreq., PS 230. Integrals of real valued functions, line integrals, the gradient, potential functions, and force fields.
- 193. ANALYTIC GEOMETRY AND CALCULUS IN CONJUNCTION WITH INTRODUCTORY PHYSICS (4).** Pr., MH 192. Coreq., PS 231. Method of integration, l'Hospital's Rule, surface integration and some differential equations.
- 264. ANALYTIC GEOMETRY AND CALCULUS (5).** Pr., MH 163. A continuation of MH 161-162-163. Infinite series, partial derivatives, multiple integrals.

*Temporary.

**This is a non-credit course for students in some scientific and technical curricula.

265. **LINEAR DIFFERENTIAL EQUATIONS (3).** Coreq., MH 264. First and second-order linear differential equations including the solution of such equations by infinite series.
266. **TOPICS IN LINEAR ALGEBRA (3).** Pr., MH 163. Linear spaces, vector spaces, linear transformations, matrices and determinants. Not open to students who have credit for MH 337, 531 or MH 505 or MH 537.
267. **INTRODUCTORY PROBABILITY AND STATISTICS (5).** Coreq., MH 161. Designed for students whose fields require a basic knowledge of probability and for those who plan to take upper level courses in probability and statistics. Conditional probability, independence and random variables with emphasis on discrete random variables.
269. **ELEMENTARY DIFFERENTIAL EQUATIONS (5).** Coreq., MH 264. Ordinary differential equations with applications. Credit for this course precludes credit for MH 265.
271. **INTRODUCTION TO MATHEMATICAL PROGRAMMING (3).** Coreq., MH 264. Introduction to the organization and characteristics of the digital computer, and to programming in FORTRAN, with applications to problems in algebra and the calculus.
272. **MATHEMATICAL PROGRAMMING AND NUMERICAL ALGORITHMS (3).** Coreq., MH 265, and MH 266. Pr., MH 271. Introduction to numerical methods for solution of ordinary differential equations and systems of linear equations. Further programming practice in FORTRAN.
- 281-282. **ELEMENTARY MATHEMATICS (5-5).** Pr., sophomore standing. These courses provide appropriate mathematical insights for elementary school teachers. Emphasis is on the structure of the number systems, the basic concepts of algebra and informal geometry. Open for credit only to students in Elementary Education, except by special permission of the Department of Mathematics.
294. **ANALYTIC GEOMETRY AND CALCULUS IN CONJUNCTION WITH INTRODUCTORY PHYSICS (4).** Pr., MH 193. Coreq., PS 232. Sequences, series and an introduction to complex numbers.
301. **HISTORY OF MATHEMATICS (3).** Pr., MH 163 or departmental approval. The evolution of modern mathematics from its motivational roots in the physical sciences; the lives and contributions of outstanding mathematicians; the parallel development of mathematics and western culture.
- 331-332. **INTRODUCTION TO MODERN ALGEBRA I, II (5-5).** Pr., MH 163. Sets, mapping, the integers, isomorphisms, and homomorphisms; groups, rings, fields, ideals.
337. **INTRODUCTION TO LINEAR ALGEBRA (5).** Pr., MH 163. Matrices; systems of equations; determinants; vector spaces; linear transformations; inner products; unitary, Hermitian, and normal matrices; eigenvalues and eigenvectors; diagonalization of Hermitian matrices. Credit for this course precludes credit for MH 266.
350. **THE THEORY OF INTEREST (5).** Pr., MH 161, 162. The course should provide appropriate preparation for students preparing to take Part III of the Society of Actuaries Examination. Measurement of interest; accumulation and discount; force of interest; equations of value; bonds; installment loans; depreciation, depletion, and capitalized cost.
362. **ENGINEERING MATHEMATICS I (3).** Pr., MH 265. Fourier Series, partial differential equations, special functions.
491. **SPECIAL PROBLEMS (1-5).** Pr., departmental approval, junior standing. An individual problems course. Each student will work under the direction of a staff member on some problem of mutual interest.

ADVANCED UNDERGRADUATE AND GRADUATE

501. **THE CALCULUS OF VECTOR FUNCTIONS (3).** Pr., MH 266 or departmental approval. Derivative and integral of vector functions, gradient, divergence, curl, Green's Theorem, Stokes Theorem.
502. **TENSOR ANALYSIS (3).** Pr., MH 161-264, 501. The Frechet derivative; tensors and tensor valued functions; coordinate transformations; co-variant and contravariant tensors; tangent spaces; differential forms; wedge products of forms; Einstein summation convention (raising and lowering indices); Riemannian metrics.
503. **ENGINEERING MATHEMATICS II (5).** Pr., MH 265. Complex numbers, functions, mappings, residues, contour integration.
505. **MATRIX THEORY AND APPLICATIONS (5).** Pr., MH 266 or 531. Canonical forms, determinants, linear equations, characteristic value problems.
506. **ELEMENTARY PARTIAL DIFFERENTIAL EQUATIONS (3).** Pr., MH 362. First and second order linear partial differential equations with emphasis on the methods of eigenfunction expansions.
507. **INTRODUCTION TO CELESTIAL MECHANICS (5).** Pr., departmental approval. Dynamics of a particle, two-body problems, coordinate transformations, series expansions in elliptic motion, introduction to general perturbation theory.
508. **ELEMENTS OF NUMERICAL ANALYSIS (5).** Pr., MH 264. The numerical solutions of selected problems arising in calculus and algebra along with the programming techniques.
- 510-511. **CALCULUS OF VARIATIONS I, II (3-3).** Pr., MH 265 or 269. Fundamental concepts of extrema of functions and functionals; the simplest problem of the calculus of variations; first and second variations; generalizations of the simplest problem; sufficient conditions; constrained functionals; the general Lagrange problem; optimal control.
515. **ALGEBRA FOR APPLIED MATHEMATICS (5).** Pr., MH 266. Ideas and techniques of modern algebra which are useful to applied mathematicians, engineers, and scientists. Topics chosen from binary relations and graphs; semigroups, monoids, and groups; finite-state machines (automata); Boolean algebra; coding theory.

- 518. ANALYSIS FOR APPLIED MATHEMATICS (5).** Pr., MH 265, 266. Linear functions and transformations, concepts of the calculus including uniform continuity and uniform convergence, curves, series of functions, complex differentiation and differential equations. Designed primarily for students in engineering, physical sciences and applied mathematics who are likely to pursue more advanced work. Not open for credit to students in the MH curriculum.
- 520-521-522. ANALYSIS I, II, III (5-5-5).** Pr., MH 264. The real number system, theorems concerning number sets, sequences, graphs of functions; Riemann-Stieltjes integration, continuity, the derivative and functions of bounded variation; functions whose domains are in Euclidean spaces.
- 524. FOURIER ANALYSIS (5).** Pr., MH 521; an ability to program FORTRAN. Convergence and oscillation theorems for Fourier Series. Gibbs phenomenon. Fourier transform. Fast Fourier transform.
- 528-529. LINEAR DIFFERENTIAL SYSTEMS (3-3).** Pr., MH 522 or departmental approval. Systems of linear ordinary differential equations, series solutions, approximate solutions.
- 531. INTRODUCTION TO MODERN ALGEBRA III (5).** Pr., MH 332. A continuation of MH 331-332.
- 537. LINEAR ALGEBRA (5).** Pr., MH 266 and 332. Linear transformations, matrix algebra, finite-dimensional vector spaces.
- 541-542. GEOMETRY, A MODERN VIEW I, II (5-5).** Pr., MH 163. A development of geometry using the real number system and measurement as proposed by G. D. Birkhoff. The course moves rapidly, with definitions and proofs, through the foundations of geometry and into the main body of geometric theory.
- 543. LINEAR GEOMETRY (5).** Pr., MH 163. Transformations in projective, affine, and Euclidean planes.
- 544. COMBINATORIAL GEOMETRY IN THE PLANE (5).** Pr., MH 163. Helly's and related theorems.
- 550-551. METRIC SPACES (3-3).** Pr., MH 521 or departmental approval. The elementary properties of metric spaces with special attention to the line and the plane.
- 560. INTRODUCTION TO NUMERICAL ANALYSIS (5).** Pr., MH 265, 269 or 528; an ability to program in FORTRAN. Polynomial approximation, numerical differentiation and integration, solution of ordinary differential equations (initial value problems) error analysis.
- 561. NUMERICAL MATRIX ANALYSIS (5).** Pr., MH 266 or 531; an ability to program FORTRAN. Numerical solution of algebraic equations and of systems of linear equations, solution of boundary value problems, numerical calculation of characteristic values and vectors, error analysis.
- 564. PROBABILITY THEORY (5).** Pr., MH 520 or departmental approval. Complete probability fields, probability functions, random variables, convergent sequences of random variables, conditional probability, distribution functions, various applications.
- 567. MATHEMATICAL STATISTICS I (5).** Pr., MH 264. Introduction to probability. Random variables, discrete and absolutely continuous distributions. Standard distributions (binomial, Poisson, hypergeometric, normal, etc). Expected values, moments, and moment generating functions. Convergence and limiting distributions. Emphasis on problem solving.
- 568. MATHEMATICAL STATISTICS II (5).** Pr., MH 567. Statistical methods. Estimation, sampling theory, confidence intervals, hypothesis testing, regression, analysis of variance.
- 569. TOPICS IN PROBABILITY AND STATISTICS (1-5).** (May be repeated for credit). Pr., MH 567 or CQI. A mathematical treatment of certain topics in probability and statistics. Topics will vary from year to year and will be chosen from the following: Applied stochastic process, time series, experimental design, sampling theory, non-parametric methods, and others.
- 571. DISCRETE OPTIMIZATION THEORY (5).** Pr., MH 163. An introduction to the mathematical aspects of theoretical computer science.
- 573-574. COMBINATORIAL MATHEMATICS I, II (5-5).** Pr., MH 163. Distinct representatives, generating functions, inversion formulae, permutations and combinations, difference sets, block designs, finite geometries, orthogonal Latin squares, coding theory.
- 575. GRAPH THEORY (5).** Pr., MH 163. Connectivity, traversability, coverings, planarity, colorability, digraphs, algorithms and applications.
- 581. FOUNDATIONS OF GROUP THEORY FOR SECONDARY SCHOOL TEACHERS* (4).** Pr., one course above MH 163. Elements of the theory of groups emphasizing geometric and other examples.
- 582. FOUNDATIONS OF STATISTICS FOR SECONDARY SCHOOL TEACHERS* (4).** Pr., one course above MH 163. Discrete probability distributions; introduction to statistical inference.
- 583. FOUNDATIONS OF LINEAR ALGEBRA FOR SECONDARY SCHOOL TEACHERS* (4).** Pr., one course above MH 163. Matrix algebra, quadratic forms with emphasis on geometric interpretations in two and three dimensions.
- 584. FOUNDATIONS OF NUMBER THEORY FOR SECONDARY SCHOOL TEACHERS* (4).** Pr., one course above MH 163. Divisibility, Diophantine equations, congruences.
- 585. FUNDAMENTALS OF ALGEBRA FOR SECONDARY SCHOOL TEACHERS* (4).** Pr., one course above MH 163. Structure of the ring of integers; polynomial rings.

*Not available to majors or graduate students in the area of science or mathematics.

586. **FOUNDATIONS OF NON-EUCLIDEAN GEOMETRY FOR SECONDARY SCHOOL TEACHERS* (4).** Pr., one course above MH 163. B.C. geometry, hyperbolic geometry, absolute geometry, parallel postulates.
587. **FUNDAMENTALS OF ANALYSIS FOR SECONDARY SCHOOL TEACHERS* (4).** Pr., one course above MH 163. Mathematical analysis with emphasis on basic principles and relationships. Students will develop the material from basic concepts.
- 588-589. **CERTIFICATION MATHEMATICS FOR SECONDARY SCHOOL TEACHERS* (5-5).** Pr., undergraduate major in mathematics and departmental approval. Summer. For secondary school teachers who are working toward Class A certification. Topics will be selected from analysis, algebra and geometry according to the needs and interests of the students enrolled.

GRADUATE

- 602-603. **CELESTIAL MECHANICS I, II (5-5).** Pr., MH 507 or departmental approval. Elliptic motion, potentials of attracting bodies, numerical integration and differential correction of orbits, lunar theory, theory of perturbations, Lagrange's method and introduction to canonical variables, the disturbing function, artificial satellite orbit theory.
- 607-608-609. **APPLIED MATHEMATICS I, II, III (5-5-5).** Pr., approved graduate standing. Scalar, vector, and dyadic fields; equations governing fields; Helmholtz's and Laplace's equations in curvilinear coordinates; separation of variables; boundary conditions and eigenfunctions; Green's functions.
610. **SPECIAL FUNCTIONS (5).** Pr., departmental approval.
613. **TENSOR ANALYSIS (5).** Pr., departmental approval.
- 620-621. **FUNCTIONS OF REAL VARIABLES I, II (5-5).** Pr., departmental approval. Measure theory and Lebesgue integration.
- 622-623. **FUNCTIONS OF A COMPLEX VARIABLE I, II (5-5).** Pr., departmental approval. Complex numbers; analytic functions; derivatives, Cauchy integral theorem and formula; Taylor and Laurent series; analytic continuation; residues; maximum principle; Riemann surfaces; conformal mapping; families of analytic functions.
- 624-625-626. **NORMED LINEAR SPACES (5-5-5).** Pr., departmental approval. Bounded linear transformations and linear functionals on Banach and Hilbert spaces, including conjugate spaces, adjoint operations, self adjoint operators, spectral theory, applications to particular spaces.
- 628-629. **ADVANCED THEORY OF DIFFERENTIAL EQUATIONS (5-5).** Pr., departmental approval. Existence, uniqueness and continuation theorems for ordinary and partial differential equations; nature of solutions. The first quarter will be devoted to ordinary equations, the second to partial differential equations.
- 631-632. **MODERN ALGEBRA I, II (5-5).** Pr., departmental approval. Numbers; sets; groups; rings; fields of polynomials; Galois theory.
633. **THEORY OF GROUPS (5).** Pr., MH 631. Sylow theory, abelian groups, chain conditions.
634. **THEORY OF RINGS (5).** Pr., MH 632 or departmental approval. Structure of rings, ideals in commutative rings.
635. **ABELIAN GROUPS (5).** Pr., departmental approval. An axiomatic development of abelian group theory; decomposition theorems, finitely generated groups, rank, divisible groups, pure subgroups, basic subgroups, ulm factors.
- 637-638-639. **MATRICES (5-5-5).** Pr., MH 537. Special types of matrices; reduction to canonical form; function of matrices; readings in current literature.
- 640-641-642. **FUNCTIONAL ANALYSIS (5-5-5).** Pr., MH 626 or departmental approval. Topics in the advanced theory of linear functionals and operators on Banach and Hilbert spaces, chosen to lead students into research work in this field.
- 650-651-652. **GENERAL TOPOLOGY (5-5-5).** Pr., departmental approval. An axiomatic development of point-set topology; connectivity, compactness, separability, topological equivalence, well-ordering, inner limiting sets, Cartesian products.
653. **DIMENSION THEORY (5).** Pr., departmental approval. The topological study of dimension in separable metric spaces.
- 654-655-656. **POINT-SET TOPOLOGY (5-5-5).** Pr., MH 652. Upper semi-continuous collections, indecomposable continua, metrization problems, inverse limits, other topics.
- 657-658. **EUCLIDEAN TOPOLOGY (5-5).** Pr., MH 650. Topology with emphasis on those areas which distinguish among the polyhedra in Euclidean spaces (e.g., Theory of Retracts).
661. **ADVANCED NUMERICAL ANALYSIS (5).** Pr., MH 561, and 265 or 528. Numerical solution of partial differential equations.
- 664-665-666. **PROBABILITY (5-5-5).** Pr., knowledge of Lebesgue integration. Probability measures, random variables, distribution functions (discrete, absolutely continuous, and singular), expectation, characteristic functions (Fourier transforms), independence, limit theorems, convergence to Poisson and normal distributions, central limit theorem, Stochastic processes and Brownian motion, probability measures on metric spaces.

*Not available to majors or graduate students in the area of science or mathematics.

- 667-668-669. MATHEMATICAL THEORY OF APPLIED STATISTICS (5-5-5).** Pr., MH 505 and 568, or equivalent. A rigorous mathematical development of some of the important topics in applied statistics. Analysis of variance and covariance, linear models and regression. Introduction to experimental design, Latin squares, incomplete blocks, confounding, simple random sampling, stratified sampling methods. Non-parametric methods.
- 670. UNIFORM SPACES (5).** Pr., MH 652 and departmental approval. Uniform spaces, uniform topology, uniformly continuous functions, completions of uniform spaces, other topics.
- 673-674-675. COMBINATORIAL THEORY (5-5-5).** Pr., MH 332. Topics of current interest in combinatorial theory to include enumeration theory, systems of distinct representatives, Latin squares, quasigroups, block designs, Steiner triple systems, Room squares, and finite geometries.
- 677-678-679. MULTIVARIATE STATISTICAL ANALYSIS (5-5-5).** Pr., 505 and 568, or equivalent. A rigorous mathematical development of multivariate statistical analysis. The Wishart distribution, Hotelling's T^2 distribution and its applications, discriminant analysis, principal components, factor analysis, multivariate normal distribution, simple, partial, multiple correlation.
- 691. DIRECTED READING IN ALGEBRA. (CREDIT TO BE ARRANGED.)** Pr., 10 hours of 600 courses in the area.
- 692. DIRECTED READING IN ANALYSIS. (CREDIT TO BE ARRANGED.)** Pr., 10 hours of 600 courses in the area.
- 693. DIRECTED READING IN APPLIED MATHEMATICS. (CREDIT TO BE ARRANGED.)** Pr., 10 hours of 600 courses in the area.
- 694. DIRECTED READING IN GEOMETRY. (CREDIT TO BE ARRANGED.)** Pr., 10 hours of 600 courses in the area.
- 695. DIRECTED READING IN TOPOLOGY. (CREDIT TO BE ARRANGED.)** Pr., 10 hours of 600 courses in the area.
- 696. DIRECTED READING IN MATRIX THEORY. (CREDIT TO BE ARRANGED.)** Pr., 10 hours of 600 courses in the area.
- 697. DIRECTED READING IN NUMERICAL ANALYSIS. (CREDIT TO BE ARRANGED.)** Pr., 10 hours of 600 courses in the area.
- 699. RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)** May be repeated for credit.
- 799. RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)**

Mechanical Engineering (ME)

Professors Askew, *Interim Head*, Barbin, Beckett, Bussell, Dyer, Goodling, Jemian, Jones, Maples, Penrod, Reece, Shaw, and Swinson
Associate Professors Cooley, Fluker, Leppert, Scarborough, Smith, Wilcox, and Yu
Assistant Professors Madsen and Maxwell

- 202. ENGINEERING MATERIALS SCIENCE—STRUCTURE (3).** Pr., CH 103, PS 220 or 205. Theories and structures of crystalline and amorphous materials. Bonding, crystal classes, phase equilibrium relationships, diffusion and phase transformations. (Same course as MTL 202.)
- 205. APPLIED MECHANICS—STATICS (4).** Pr., PS 220; Coreq., MH 264. Resolution and composition of forces; equilibrium of force systems; friction; second moments.
- 207. STRENGTH OF MATERIALS I (3).** Pr., ME 205 and MH 264; coreq., MH 265. Fundamentals of stress and strain; stress-strain relations; temperature effects; bar with axial force; thinwall cylinders; torsion.
- 211. ENGINEERING METHODS (2). LEC 1, LAB. 3.** Coreq., PS 222. Presentation and practices in use of techniques of analysis of engineering models.
- 301. THERMODYNAMICS I (4).** Pr., MH 264 and PS 221. Laws of thermodynamics; energy transformations; properties and relationships among properties; equations of state and simple processes and cycles.
- 302. THERMODYNAMICS II (3).** Pr., ME 301. Thermodynamic analysis of real and ideal cycles, and concepts of compressible fluid flow.
- 303. THERMODYNAMICS III (3).** Pr., ME 301. Property determination, Maxwell's relations, thermodynamics of mixtures, combustion, and chemical equilibrium.
- 304. ENGINEERING MATERIALS SCIENCE—PROPERTIES (3).** Pr., ME 202, 207. Relationships between structure and properties and the effects of environment. Mechanical properties, plasticity of single and poly-crystals, and properties of composite materials. (Same course as MTL 304.)
- 308. COMPUTATION LABORATORY (3). LEC. 2, LAB. 3.** Pr., MH 265. Application of analog and digital programming in Mechanical Engineering.
- 309. CORRELATIVE EXPERIMENTAL MECHANICS (2). LEC. 1, LAB. 3.** Pr., ME 207. Theories of failure; determination of stress fields by experimental techniques; introduction to photoelasticity; strain gages; relation of uniaxial test data to failure envelopes.
- 310. THERMODYNAMICS (5).** Winter. Pr., MH 163 and PS 206 or equivalent. Gases and vapors; cycles; mass and heat transfer. Open to non-Mechanical Engineering students only.

316. **STRENGTH OF MATERIALS II (4).** LEC. 3, LAB. 3. Pr., ME 207, 309. Applications of theory with emphasis on experimental verification; structures consisting of bars subjected to axial force and/or torsion; spherical and cylindrical thin wall pressure vessels; beams and long columns.
321. **DYNAMICS I (4).** Pr., ME 205; coreq., MH 265. Kinematics of points, lines, and rigid bodies; relative motion and coordinate transformations; kinetics; conservation of energy and momentum.
322. **DYNAMICS II (4).** Pr., ME 211 and 321. Matrix methods in kinematics; introduction to celestial mechanics; Euler's equations of motion; the inertia tensor; gyroscopic motion.
323. **DYNAMICS OF MACHINES (4).** LEC. 3, LAB. 3. Pr., ME 207, 308, 322. Analysis of rotating systems. Dynamic force analysis of mechanisms and complexes of mechanisms. Oscillating systems.
335. **ENGINEERING MATERIALS SCIENCE—PHYSICAL METALLURGY (4).** LEC. 3, LAB. 3. Pr., ME 304. Relations between structure and properties of metals. Melting and solidification, crystal structure, dislocation and imperfection theories, alloying, deformation, and transformations. (Same course as MTL 335.)
336. **PHYSICAL ANALYSIS OF MATERIALS I (4).** LEC. 3, LAB. 3. Pr., ME 338. The analysis and interpretation of the structures of materials using optical techniques. Specific physical properties will be measured. Samples will be prepared and processed by the students. (Same course as MTL 336.)
337. **PHYSICAL ANALYSIS OF MATERIALS II (4).** LEC. 3, LAB. 3. Pr., ME 308, 336. The analysis and interpretation of the structures and properties of materials using special techniques. Diffraction, radiography and various non-destructive test procedures will be employed. (Same course as MTL 337.)
338. **PHASE DIAGRAMS (4).** LEC. 3, LAB. 3. Pr., ME 335. Methods of representing and interpreting phase equilibria. Binary and multicomponent systems. Simpler temperature-composition systems and more complex temperature-pressure-composition systems. Major emphasis on applications. Minor emphasis on phase diagram determination and thermodynamics. (Same course as MTL 338.)
340. **FLUID MECHANICS I (3).** Pr., ME 301 and 321; coreq., ME 207. Fluid properties; fluid statics; fluid kinematics; integral forms of conservation laws—applications to exterior and interior flows; dimensional analysis.
341. **FLUID MECHANICS II (4).** Pr., ME 207 and 340; coreq., ME 302, 322. Potential theory; vorticity; stream functions; viscous flow; boundary layers; turbulent flow.
412. **MEASUREMENTS LABORATORY (3).** LEC. 2, LAB. 3. Pr., ME 308, 303, 341, 521 and 527. The theory and practice of engineering measurements, including treatment of experimental data and the design of experiments.
420. **THERMAL SYSTEMS LABORATORY (2).** LEC. 1, LAB. 3. Pr., ME 412; coreq., ME 515. Selected experiments on thermal systems evaluation.
425. **THERMODYNAMICS OF MATERIALS SYSTEMS (4).** Pr., ME 301 and 338. The laws of thermodynamics applied to the stability of materials phases, crystal imperfections, solubility, oxidation, surface and interfacial energy, and transformations. (Same course as MTL 425.)
434. **FLUID MECHANICS AND HEAT TRANSFER (5).** Pr., ME 310. Spring. Mechanics of compressible and incompressible fluids; transmission of heat by conduction, convection, and radiation. Open to non-Mechanical Engineering students only.
435. **PHYSICAL ANALYSIS OF MATERIALS III (4).** LEC. 3, LAB. 3. Pr., ME 337. The evaluation of macroscopic structural features, anisotropic materials properties and the detection and interpretation of flaws. Microscopy, radiography and other nondestructive test methods will be employed. (Same course as MTL 435.)
439. **MECHANICAL ENGINEERING DESIGN I (4).** LEC. 3, LAB. 3. Pr., ME 323, 316; coreq., ME 335, 527. Design of machine elements for static and dynamic stresses with the emphasis on synthesis and creative design.
440. **MECHANICAL ENGINEERING DESIGN II (3).** LEC. 2, LAB. 3. Pr., ME 439, or departmental approval, senior standing. The solution of typical engineering systems problems by group or team effort, requiring the development of skill and co-operation in the use of analysis, synthesis, creative design and optimization.
441. **ENGINEERING SYSTEMS (CREDIT 1-5).** Pr., senior standing and departmental approval. May be taken more than one quarter, but total credit may not exceed 10 quarter hours. Mechanical Engineering design problems requiring the development of skill in the use of analysis, synthesis and creativeness in the design of engineering systems.
444. **DESIGN FOR HAZARD REDUCTION (4).** Pr., ME 207, 321. Relationships of the mechanics of machinery and the properties of materials which lead to the design principles of hazard reduction in machines and machine systems. Open to non-Mechanical Engineering students only.
445. **TRANSFORMATIONS IN CONDENSED PHASES (4).** LEC. 3, LAB. 3. Pr., ME 337, 425, and 536. Important transformations in both metallic and non-metallic materials with crystalline or glass structures. Structures, mechanisms, distinctive characteristics and applications will be studied. Selected transformations will be studied in the laboratory. (Same course as MTL 445.)
446. **THEORETICAL MATERIALS AND ENGINEERING (3).** Pr., CHE 575 and EE 570; coreq., PS 513. The physical properties of materials in relation to modern theories. (Same course as MTL 446.)
447. **MECHANICS OF ENGINEERING MATERIALS (4).** LEC. 3, LAB. 3. Pr., CH 516, and ME 536. The mechanical properties in relation to structural features of alloys, plastics, ceramic materials and composites under static, dynamic and cyclic service and test conditions. Conditions for the attainment of optimum properties and behavior will be emphasized. (Same course as MTL 447.)
448. **INTRODUCTION TO CERAMICS (3).** Pr., ME 335 and 445. The engineering applications and design principles of important ceramic materials will be studied with particular attention directed to the structure-property relationships. Both glassy and crystalline ceramic materials will be included. (Same course as MTL 448.)

449. **PROFESSIONAL DIAGNOSTIC PROBLEMS (4).** Pr., senior standing in any engineering curriculum or departmental approval. Problems involving interaction of the different engineering science disciplines, with emphasis on engineering design, synthesis, and systems.
450. **SPECIAL PROBLEMS (CREDIT 1-5).** Pr., departmental approval, junior standing. Individual student endeavor under staff supervision involving special problems of an advanced nature. May be taken more than one quarter but total credit may not exceed 10 quarter hours. Maximum any one quarter 5 hours credit.
451. **ADVANCED PROJECTS (3). LEC. 1, LAB. 6.** Pr., ME 341, 521; coreq., ME 440, and senior standing. Individual projects of a current nature, involving both analysis and synthesis, culminating in a formal report.

ADVANCED UNDERGRADUATE AND GRADUATE

501. **STATISTICAL THERMODYNAMICS (3).** Pr., ME 301 or departmental approval. Fundamental laws of thermodynamics and thermodynamic properties from the microscopic point of view.
502. **INTRODUCTION TO OPTIMAL SYSTEMS (4).** Pr., MH 310. Application of optimal criteria to engineering problems.
503. **SENSITIVITY ANALYSIS (5).** Pr., IE 410 or equivalent and junior standing. Analysis of the sensitivity of performance of a system or process to changes in the parameters of the system.
510. **POWER PLANT SYSTEMS (5). LEC. 3, LAB. 4.** Pr., ME 302, senior standing. Theory, design, performance and applications of power plant systems.
514. **TURBOMACHINES (4).** Pr., ME 341 or departmental approval. Applications of fluid mechanics to turbomachines, such as pumps, compressors, fluid couplings, control devices, gas and steam turbines.
515. **THERMODYNAMICS OF POWER SYSTEMS (4).** Pr., ME 302, 303, 341; coreq., ME 521 or departmental approval. Design and analysis of static and dynamic thermal power systems.
521. **HEAT TRANSFER (4).** Pr., ME 340, EE 263, MH 265, or departmental approval. Fundamental principles of heat transfer by steady and unsteady conduction, thermal and luminous radiation, boiling and condensation, free and forced convection.
522. **TRANSPORT PROCESSES (3).** Pr., ME 521 or departmental approval. Transport processes involving mass, momentum, and energy transfer combined with heat and mass transfer in chemical reacting boundary layers.
527. **DYNAMICS OF PHYSICAL SYSTEMS (4).** Pr., ME 211, 323, 340. Motion of systems represented by first and second order differential equations. Transient types and response of physical systems. Transfer functions.
528. **AIR CONDITIONING AND REFRIGERATION (4).** Pr., ME 302, 521. Theory and design of heating, cooling and ventilating systems, and refrigeration systems, including cryogenics.
532. **AUTOMATIC CONTROLS (3).** Pr., MH 265, ME 341, 527. Control systems fundamentals. Systems analysis techniques. Applications to machine and process control.
536. **ENGINEERING MATERIALS SCIENCE—FERROUS METALLURGY (3).** Pr., ME 335. Design of ferrous metals following modern theory and practice. Hardenability, alloying deformation, and special purpose steels. (Same course as MTL 536.)
537. **MANUFACTURING PROCESSES AND MATERIALS (5).** Pr., junior standing. ME 335 and departmental approval. Principles and engineering problems involved in the fabrication of materials, in the selection of engineering materials, in tooling and in production methodology.
542. **COMPUTER AIDED DESIGN (3).** Pr., ME 527 or departmental approval. The computer in design. Batch and interactive processing. The use of typewriter and visual display remote terminals in the development and operation of design systems.
543. **PHOTOELASTIC STRESS AND STRAIN ANALYSIS (3).** Pr., ME 207. Theory of the polariscope; two- and three-dimensional model making and preparation; techniques of data collection and photoelastic models and analysis.

GRADUATE

604. **ADVANCED THERMODYNAMICS I (3).** Pr., ME 303, graduate standing. Classical thermodynamics of reactive and nonreactive systems; applications.
605. **ADVANCED THERMODYNAMICS II (3).** Pr., ME 604. Statistical treatment of the laws and properties of thermodynamic systems; applications.
608. **ADVANCED THERMODYNAMICS III (3).** Pr., ME 605. Thermodynamics of nonequilibrium processes.
620. **HEAT TRANSMISSION—CONDUCTION (3).** Pr., ME 521, MH 362 or departmental approval. Formulations and solutions of steady, steady periodic, and unsteady heat conduction problems.
621. **HEAT TRANSMISSION—CONVECTION (3).** Pr., ME 521. General problems of convection, forced convection heat transfer, free convection, thermodynamic boundary layers, condensing and boiling, heat transfer to liquid metals and analysis of heat exchangers.
622. **HEAT TRANSMISSION—RADIATION (3).** Pr., ME 521. Fundamental laws of radiation, net radiation methods, configuration factors, radiation through absorbing media, solar, terrestrial and celestial radiation, and thermometry and temperature control.
630. **ADVANCED STRENGTH OF MATERIALS (3).** Pr., ME 316, MH 362 or departmental approval. Stress and strain analyses of curved beams and beams on elastic foundations; energy methods; selected topics from the literature; stress and strain analyses in bars of noncircular section subjected to torsion.

631. **THEORY OF ELASTICITY I (3).** Pr., departmental approval. Theory of stress and strain and stress-strain relations. Laws of balance in momentum, moment of momentum, and energy. Solution by tensor stress function and displacement functions.
632. **THEORY OF ELASTICITY II (3).** Pr., ME 631. Continuation of solutions by potential functions. Solutions of two dimensional problems by Kolosov-Muskhelishvili methods.
633. **EXPERIMENTAL STRESS ANALYSIS (3).** Pr., ME 316. Stress analyses by experimental techniques including transmission and scattered light photoelasticity; strain gages, brittle coatings, photoelastic coatings. Moire patterns are developed.
634. **ELASTIC STABILITY (3).** Pr., ME 631 or departmental approval. Stability of conservative and nonconservative systems. Buckling of slender bars and thin-walled cross-sections; buckling of plates and shells. Buckling loads by Rayleigh-Ritz, Galerkin, and Kantorovich methods.
635. **INTERMEDIATE DYNAMICS (3).** Pr., MH 362. Dynamics of particles and systems of particles applied to engineering problems. Work and energy, and impulse and momentum principles. LaGrange's equations and Hamilton's principle.
637. **THEORY OF PLATES (3).** Pr., ME 631. Analyses of plates of various shapes under transverse and in-plane loadings with different boundary conditions. Buckling of plates due to in-plane loadings. Introduction to von Karman large deflection theory.
638. **THEORY OF SHELLS (3).** Pr., departmental approval. Introduction to differential geometry. Development of governing equations for shells under arbitrary loading. Shallow shell theory with applications. Asymptotic method for solution of differential equations in shell theory.
639. **VARIATIONAL MECHANICS (3).** Pr., departmental approval. The problem of Bolza, Mayer and LaGrange with fixed and variable end points; Hamilton's principle and LaGrange's equations; energy method; Rayleigh's principle and Rayleigh-Ritz method; Galerkin method; variational methods; applications.
640. **FLUID DYNAMICS (3).** Pr., MH 362 and graduate standing. Navier-Stokes Equations. Exact and approximate solutions. Euler's equations. Continuity. Energy equations. Irrotational flow.
641. **BOUNDARY LAYER THEORY (3).** Pr., ME 640. Hydrodynamic and thermal boundary layers. Prandtl's equations, integral relations and approximate techniques.
642. **GAS DYNAMICS I (3).** Pr., ME 640. Compressible flow equations; isentropic flow; Fanno line flow; Rayleigh line flow; shock waves; high speed flow; internal and external flows; forces on immersed bodies.
643. **GAS DYNAMICS II (3).** Pr., ME 642 and 605. Continuation of ME 642 with emphasis on real gas effects and non-equilibrium flow.
644. **TURBULENCE (3).** Pr., ME 641. Analysis of wall-affected and free turbulent flows.
660. **STRUCTURE AND PROPERTIES OF SOLIDS (3).** Pr., departmental approval. Denominations of structure are considered, via an interdisciplinary approach, from the viewpoint of providing a fundamental insight with respect to the genesis of selected macroscopic properties.
661. **CORROSION: FUNDAMENTALS AND APPLICATIONS (3).** Pr., departmental approval. Nature and mechanisms of corrosion. Effects of: material-manufacturing methods, construction and environment. Corrosion types and methods of corrosion control.
662. **PERFORMANCE OF METALS AT ELEVATED TEMPERATURES (3).** Pr., departmental approval. Fundamental behavior of metals of elevated temperatures. Commercial and experimental types of ferrous and nonferrous alloys and their suitability for elevated temperature applications.
665. **STRENGTHENING OF METALS (3).** Pr., ME 335. A treatment of the six basic mechanisms by which metals are strengthened. Emphasis is placed on causative factors and accompanying manifestations.
666. **PLASTICITY OF METALS (3).** Pr., ME 335. A quantitative treatment of: the minimization of plastic flow by means of design consideration where the phenomenon is associated with deleterious effects; the maximization of plastic flow by means of material-condition and forming method considerations where the objective is to form or shape.
667. **DISLOCATION THEORY (3).** Pr., departmental approval. The nature and properties of dislocations including crystal structure and imperfections, dislocation geometry in both ideal and real crystals, dislocation configurations, multiplication and interactions with various imperfections, and methods of observation.
675. **PLANAR MECHANISMS (3).** Pr., ME 323. Analysis of simple and complex planar mechanisms. Synthesis by finite displacement and infinitesimal motion methods.
676. **SPATIAL MECHANISMS (3).** Pr., ME 675. Analysis and synthesis of spatial mechanisms.
677. **SELECTED TOPICS IN MECHANICAL DESIGN (3).** Pr., ME 630 and 675. Dynamic properties of trains of mechanisms; hydrostatic and hydrodynamic lubrication; thermal equilibrium; wear and fatigue problems; design techniques utilizing modern computational facilities.
678. **CONCEPTUAL DESIGN OF MECHANICAL SYSTEMS (3).** Pr., ME 440 or departmental approval. Engineering problem definition; solution set development; selection criteria. optimization techniques; utilization of computational methods in the design of components.
679. **DYNAMIC SYSTEMS DESIGN (3).** Pr., ME 527 or departmental approval. Design of time-responsive systems; system modeling and simulation, development of system component requirements; determination of the characteristics of the designed systems.

- 680. NOISE CONTROL IN MECHANICAL SYSTEMS (3).** Pr., departmental approval. Sound: its propagation; reflection; absorption; scattering; sources in machinery. Alteration of machine parameters for noise reduction.
- 681. DESIGN FOR OPTIMUM ENERGY UTILIZATION (3).** Pr., ME 604 or departmental approval. Design and selection of energy systems for optimum energy utilization in commercial, industrial, residential and transportation sectors.
- 682. ENVIRONMENTAL SYSTEMS DESIGN (3).** Pr., ME 604 or departmental approval. Design of environmental systems for the support of life, for comfort, for control of local environmental envelopes.
- 683. SOLAR ENERGY UTILIZATION (3).** Pr., ME 622 or departmental approval. Measurement and utilization of solar energy for terrestrial applications.
- 684. COMBUSTION AND FUEL TECHNOLOGY (3).** Pr., ME 303 and 521. Conventional and nonconventional fuels; thermodynamics and chemical kinetics of combustion processes, diffusional and kinetically controlled combustion processes, knocking in internal combustion engines, and instability of flame fronts.
- 687. AUTOMATIC MACHINERY AND PROCESS (5).** Pr., ME 532 or equivalent. Analysis and control of automatic machinery and automatic processes. Design and layout of production machinery for automatic and continuous flow.
- 688. PRODUCTION ENGINEERING LABORATORY (2-5).** Pr., ME 537 or equivalent. Actual production problems associated with highly engineered products are addressed with the goal of reducing transition problems between prototype and full production of high-technology components and systems.
- 690. SEMINAR (CREDIT TO BE ARRANGED).** May be taken more than one quarter.
- 691. DIRECTED READING IN MECHANICAL ENGINEERING (CREDIT TO BE ARRANGED).** May be taken more than one quarter.
- 692. ENGINEERING ANALYSIS (3).** Pr., departmental approval. Equilibrium, eigenvalue, and propagation problems of continuous systems. Physical laws and mathematical properties discussed with considerable emphasis on numerical solutions.
- 699. RESEARCH AND THESIS (CREDIT TO BE ARRANGED).** May be taken more than one quarter.
- 799. RESEARCH AND DISSERTATION (CREDIT TO BE ARRANGED).** May be taken more than one quarter.

Military Science (MS)

BASIC PROGRAM*

First Year (Freshman)

Military Science I

- 101. THE U.S. ARMY TODAY AND TOMORROW (1).** LEC. 1. The War Eagle Special! Features a field trip with rafting, camping, and rappelling. Class topics include role of women in the Army, job specialties, military salaries, options available to ROTC graduates through the Army, Army Reserve and National Guard, and contemporary issues concerning today's student.
- 102. INTRODUCTION TO LEADERSHIP AND MANAGEMENT (1).** Introductory basic principles and techniques of leadership and management.
- 103. FIRST AID (CPR) (1).** LEC. 1. Development of first aid knowledge, skill ability, and personal judgement in basic life support cardiopulmonary resuscitation (CPR).

Second Year (Sophomore)

Military Science II

- 201. MAP THEORY AND LAND NAVIGATION (1).** LEC. 1. Basic map reading including principles of land navigation, methods of expressing direction, use of the lensatic compass, map orientation, map classification, elevation, and relief.
- 202. MILITARY POWER AND NATIONAL SECURITY (1).** LEC. 1. Examines the structure and operation of the national security system in the United States, contemporary issues concerning the military and its relationship to American society, and the nature and concept of military power.
- 203. INTRODUCTION TO SMALL UNIT TACTICS (1).** LEC. 1. The functions, duties, and responsibilities of junior leaders; operations of the basic military team; and development of leadership potential through practical exercises.

ADVANCED PROGRAM**

Third Year (Junior)

Military Science III

MILITARY SCIENCE III (Pr., MS I & MS II or Basic Camp or equivalent training.)

- 301. ADVANCED MAP THEORY, LAND NAVIGATION, AND ORIENTEERING TECHNIQUES (3).** LEC. 3, LEADERSHIP LAB. 1. Map and aerial photograph reading including marginal information, map and military symbology, use of the compass, and determining scale, distance, elevation, and relief.

- 302. APPLIED MILITARY TRAINING TECHNIQUES (3).** Introduction to US Army's training program. Principles and techniques of military training including practical exercises in lesson plan development and presentation of performance oriented class. Conduct of live-fire, rifle range exercise. Orientation on the various branches of the Army.
- 303. ROTC ADVANCED CAMP PREPARATION (3).** ROTC Advanced Camp preparation to include basic military skills development, physical conditioning, land navigation, rappelling, small unit tactics, and field training exercises.
- 305. RANGER OPERATIONS, TACTICS, AND PHYSICAL CONDITIONING (1). LEC. (0), LAB. 2.** Mountaineering techniques, patrolling, land navigation, ambushes, hand-to-hand combat, small boat training, and two field exercises per quarter.
- 306. LEADERSHIP LAB (1).** Mandatory requirement for all contract students. Recommended for all non-contract students.

Fourth Year (Senior)

Military Science IV

- 401. THE MANAGEMENT SIMULATION PROGRAM (3).** Development and application of basic managerial skills to simulated military and civilian management situations.
- 402. ADVANCED MILITARY LEADERSHIP AND MANAGEMENT I (3).** The officer's commission, professional ethics, customs and courtesies, and role in serving the nation. Analysis of the Officer and Enlisted Personnel Management Systems. Introduction to the Code of Conduct and military judicial system.
- 403. ADVANCED MILITARY LEADERSHIP AND MANAGEMENT II (3).** The responsibilities of command; mission, organization, and functions of an Army division; command and staff relationships and functions; Army logistical system; and officer education system.
- 404. LEADERSHIP LAB (0). 2 HR. LAB.** For advanced course Military Science students not enrolled in ROTC during a quarter because of leave of absence or who have completed all required classroom instruction.

*Basic Program students must complete a total of six courses to be eligible for the Advanced Program. The following courses may be substituted for any of the Basic Program courses: PE 133, Orienteering; PE 139, Wilderness Skills; and PE 162, Rifle Marksmanship. All members of the University Rifle Team should enroll in PE 362, Varsity Rifery every quarter in which they are active with the team. All members of the ROTC Ranger Company should enroll every quarter in MS 305, Ranger Operations, Tactics, and Physical Conditioning. HY 309, Military History of the U.S. may be taken in lieu of MS 202, Military Power and National Security.

**Members of the ROTC Ranger Company should enroll every quarter in MS 305, Ranger Operations, Tactics, and Physical Conditioning.

Music (MU)

Professors Hinton, Head, Moore, Rosenbaum, Tamblin, and Walls
Associate Professors Bennett, C. Gossett, Howard, L. Morgan, Smith,
Stephenson, and Vinson

Assistant Professors Alexander, Greenleaf, Mayfield, J. Morgan, Richardson, and
Summerville

Instructors S. Gossett, Fansler, and Wiley

- 100. MUSIC CONVOCATION (0).** All quarters. Required of all music students each quarter. Performance & lectures by faculty, guest artists, and students. Music & music education majors are expected to perform at the teacher's discretion and in accordance with departmental rules.
- 131-132-133. MATERIAL AND ORGANIZATION OF MUSIC (5-5-5).** A systematic study of harmony, counterpoint, form and style through the literature of music.
- 211-212. SERVICE PLAYING (1).** Hymn playing, modulation, selected anthems and oratorio selections, simple improvisation and transposition.
- 231-232-233. MATERIAL & ORGANIZATION OF MUSIC (5-5-5).** Pr., 133. Continuation of the study of harmony, counterpoint, form and style in music.
- 251-252-253. SURVEY OF MUSIC LITERATURE (1-1-1). LEC. AND LAB. 3-3-3.** Presentation of instrumental solo, opera and symphonic music, acquainting the student with musical compositions and composers with emphasis on music literature of the past three centuries.
- 311. LITURGIES (3).** Liturgical worship service of Roman Catholic and Protestant churches, plus non-liturgical forms of other Protestant denominations.
- 312. HYMNODOLOGY (3).** The musical significance of hymns of the Christian church from the earliest times to the present.

- 331-332-333. MATERIALS AND ORGANIZATION OF MUSIC (5-5-5).** Pr., 233. Continuation of second year systematic study of harmony, counterpoint, form and style through the literature of music.
- 337-338-339. MODERN HARMONY I, II, III (3-3-3).** Pr., 233. Twentieth century harmonic devices. An integrated approach to understanding contemporary writing with emphasis on original work and analysis of the principal departments from "traditional" harmony.
- 351-352-353. MUSIC HISTORY I-II-III (3-3-3).** Development of music from early times to the present day. Lectures, recorded examples, readings.
- 361-362-363. CONDUCTING I-II-III (3-1-1).** Pr., MU 133. I. Elementary basic baton techniques and introduction to score reading. II. Choral conducting. Elementary course in choral score reading and conducting choir and glee clubs. III. Instrumental conducting. Elementary course in instrumental score reading and conducting band, orchestra and instrumental ensembles.
- 371. INTRODUCTION TO MUSIC (3).** Open to Elementary Education and Family and Child Development Majors only. The understanding of music including an explanation of basic terms, notations, rhythm, tonal system, vocal and piano score readings.
- 409T. MARCHING BAND TECHNIQUES (3).** Fundamental methods and procedures of the Marching Band.
- 414. CARE AND REPAIR OF MUSICAL INSTRUMENTS (1). LEC. 1, LAB. 3.** Pr., senior standing. Selection, care and repair of woodwind, brass and string instruments with emphasis on adjustments which should be made by the instrumental director.
- 415. ORGAN LITERATURE AND DESIGN (3).** Survey of organ literature correlating the forms of compositions and types of organs for which the music was written.
- 416. CHURCH MUSIC SEMINAR (3).** Pr., MU 311, 312, 361, 362, 415, or 422, or COI. The processes of establishing a complete Church Music program. Supervised directing of choral ensemble.
- 434-435-436. MUSIC COMPOSITION I-II-III (3-3-3).** Pr., 233. Analysis, study, and writing of musical compositions in small, compound, and larger musical forms with emphasis on both stylistic and individual creative writing.
- 442T. VOCAL PEDAGOGY (3).** For prospective voice teachers. An intensive study of the materials and methods of voice training. Classification and analysis of teaching repertoire.
- 443T. STRING PEDAGOGY (3).** Mechanics of stringed instruments. Teaching methods, schools, and systems. Teaching literature and repertoire. For either violin, viola, cello, string bass or harp.
- 444T. INSTRUMENTAL PEDAGOGY (3).** Mechanics of brass or woodwind instruments. Teaching methods and repertoire with emphasis on solo instrumental literature.
- 445. THEORY PEDAGOGY (3).** Required of seniors majoring in theory and composition. Designed to present the problems of sightsinging, rhythmic dictation, melodic and harmonic dictation, and part writing from a pedagogical viewpoint.
- 447-448-449. PIANO PEDAGOGY (3-3-3).** For prospective piano teachers. Teaching methods for beginners in private and group instruction. The intermediate and advanced student. Analysis of teaching repertory. Observation and practical experience.
- 452. VOCAL LITERATURE (3).** Pr., junior standing. Vocal literature from Elizabethan time to the present, including representative European and American repertoire.
- 454. INSTRUMENTAL LITERATURE (3).** Pr., junior standing. Analysis and study of orchestral scores and parts from the classic, romantic and modern literature.
- 455. OPERA LITERATURE (3).** Pr., junior standing. Vocal music of the opera from the Baroque to the present time.
- 457-458-459. KEYBOARD LITERATURE (1-1-1).** Pr., junior standing. Masterwork for keyboard from the Baroque Period to the present.

(T) Indicates courses taught primarily for music education students.

ADVANCED UNDERGRADUATE AND GRADUATE

- 522-523-524. THEORY REVIEW (3-3-3).** No credit for Applied Theory Composition or Pedagogy Majors. Harmonic techniques of the 18th and 19th centuries, with special emphasis on style and design.
- 537-538-539. ORCHESTRATION I-II-III (3-3-3).** Pr., MU 233. Ranges, notation, and characteristics of orchestral instruments. Exercises in arranging for combinations of string and wind instruments. Theory and practice of orchestration for full orchestra.
- 553. CHORAL LITERATURE (3).** Pr., junior standing. Chronological study of choral music from the Middle Ages to the present including opera, and oratorio with detailed examination of representative works.

GENERAL ELECTIVE COURSES

- 201. FUNDAMENTALS OF MUSIC (3).** Music primarily to develop functional piano skills, sight-reading, rhythm and melodic skills.
- 372. HISTORY OF JAZZ (3).** The growth of Jazz from its African and European roots to current experimentation.
- 373. APPRECIATION OF MUSIC (3).** May not be taken for credit by Music Majors or Minors. Outstanding composers and compositions. No previous music training required; an orientation in the art of listening.

374. **MASTERPIECES OF MUSIC (3).** May not be taken for credit by Music Majors or Minors. Representative musical works of each great period of musical history. No previous music training required.
- 477-478-479. **MUSIC ARRANGING (3-3-3).** By consent. Project course in arranging various combination from quartet to symphonic band, and arranging for solo and choral groups.

GROUP PERFORMANCE COURSES

- 121-122-123. **UNIVERSITY SINGERS (1 HOUR CREDIT PER QUARTER).** May be taken with or without credit. A select choral ensemble for study and performance of madrigals, pop music, show tunes, and choral music of the jazz idiom. Open to any Auburn student by audition only.
- 124-125-126. **CONCERT BAND (1 HOUR CREDIT PER QUARTER).** Members of the Band are selected during the first week of each quarter. A minimum of 4 rehearsal hours per week is required, with extra rehearsals scheduled as necessary. Band members are required to be present at all rehearsals and all public performances. Students enrolled in Concert Band will have the drill portion of Basic Military Training waived. (May be taken with or without credit.)
- 127-128-129. **ORCHESTRA (1 HOUR CREDIT PER QUARTER).** Members of the symphonic orchestra are selected by try-outs during the first week of each quarter. (May be taken with or without credit.)
130. **JAZZ LABORATORY BAND (1).** A musical ensemble for the study and performance of music relating to the jazz idiom. By audition only.
- 221-222-223. **CHORAL UNION (1 HOUR CREDIT PER QUARTER).** Open to any Auburn student by consent of choral director. (May be taken with or without credit.)
224. **MARCHING BAND (1 HOUR CREDIT PER QUARTER).** Fall Quarter only. Provides music for athletic contests and half-time shows at football games, various parades, pep rallies, and other campus and off-campus events. During the fall quarter, will rehearse a minimum of 6 hours per week. Physical Education may be waived for members of the Marching Band. In addition, students will have the drill portion of basic military waived when enrolled in Marching Band. See Band Director for details. (May be taken with or without credit.)
- 227-228-229. **OPERA WORKSHOP (1 HOUR CREDIT PER QUARTER).** Open to all students interested in opera, including performance, stage-craft, make-up, conducting, and coaching. A minimum of three hours per week rehearsal or stage-craft is required with extra time scheduled as necessary. (May be taken with or without credit.)
- 321-322-323. **CONCERT CHOIR (1 HOUR CREDIT PER QUARTER).** CONCERT CHOIR is a mixed chorus for study and performance of serious choral literature; open to any Auburn student by audition only. (May be taken with or without credit.)
- 324-325-326. **MUSIC ENSEMBLE (1 HOUR CREDIT PER QUARTER).** COI. Primarily for advanced musicians for the study and performance of musical compositions for small instrumental and vocal groups. A minimum rehearsal of three hours per week required. (May be taken with or without credit.) Includes brass, woodwind, percussion and piano ensembles.
327. **PIANO ENSEMBLE (1 HOUR CREDIT PER QUARTER).** Study through performance of the ensemble literature for keyboard. May be repeated for credit.

Performance

Individual instruction is available in voice, piano, organ, strings, woodwinds, harp, brass and percussion. One 1 hour lesson or two half-hour lessons per week.

Students desiring study in performance must be approved by the Head of the Department of Music before entrance into the course.

080. **PERFORMANCE (0).** May be repeated. Individual instruction in instrumental or vocal areas. Rudimentary practice as related to each discipline.
- 181-182-183. **PERFORMANCE (3-3-3).**
- 281-282-283. **PERFORMANCE (3-3-3).**
- 381-382-383. **PERFORMANCE (3-3-3).**
- 481-482-483. **PERFORMANCE (3-3-3).** Individual instruction in instrumental or vocal areas. For Bachelor of Music majors only.
- 184-185-186. **PERFORMANCE (1-1-1).**
- 284-285-286. **PERFORMANCE (1-1-1).**
- 384-385-386. **PERFORMANCE (1-1-1).**
- 484-485-486. **PERFORMANCE (1-1-1).** Individual instruction in instrumental or vocal areas.
- 187-188-189. **PERFORMANCE (1-1-1).**
- 287-288-289. **PERFORMANCE (1-1-1).**
- 387-388-389. **PERFORMANCE (1-1-1).**

487-488-489. PERFORMANCE (1-1-1). Individual instruction in instrumental or vocal areas. For students in Elementary and Secondary Education, all music minors, and applied music electives.

660. PERFORMANCE (3-3-3).

The amount of credit in Performance study is based on the following practice schedule:

1 cr. hr.—5 hours weekly practice.

3 cr. hrs.—15 hours weekly practice.

Individual Instruction Fees Per Course (Per Quarter) . . . \$40.00

This additional fee to be paid at the time of registering for each Performance Course of individual instruction. Instruction is available in one hour or two half-hour lessons per week.

Class Instruction in Performance

The Music Department offers a number of classes in Performance open to Music Majors and Minors and to regularly registered college students who have had previous music training. These classes meet two hours per week and carry one hour credit.

104-105-106. PIANO CLASS (1-1-1). (2-2-2 LEC. AND LAB.) Class instruction and practice in the rudiments of music as applied to piano playing.

107-108-109. VOICE CLASS (1-1-1). (2-2-2 LEC. AND LAB.) Class instruction and practice in the rudiments of music as applied to voice.

110-111-112T. STRING INSTRUMENTS CLASS (1-1-1). (2-2-2 LEC. AND LAB.) Class instruction and practice in the rudiments of music as applied to violin, viola, cello and contrabass playing.

113-114-115T. BRASS INSTRUMENTS CLASS (1-1-1). (2-2-2 LEC. AND LAB.) Class instruction and practice in the rudiments of music as applied to trumpet, trombone and other brass instruments.

116-117-118T. WOODWIND INSTRUMENTS CLASS (1-1-1). (2-2-2 LEC. AND LAB.) Class instruction and practice in the rudiments of music as applied to clarinet, oboe, bassoon, flute and other woodwind instruments.

119T. PERCUSSION INSTRUMENTS CLASS (1). (2 LABS.) Class instruction and practice in the rudiment of music as applied to percussion instruments: drums, bells, cymbals, triangle, tympani, etc.

(T) Indicates courses taught primarily for music education students.

ADVANCED UNDERGRADUATE AND GRADUATE

522-523-524. THEORY REVIEW (3-3-3). Pr., senior standing and departmental approval. No credit for Applied, Theory-Composition, or Pedagogy majors. A review of the harmonic techniques of the 18th and 19th centuries, with special emphasis on style and design.

GRADUATE

600-601-602. ADVANCED INSTRUMENTAL AND CHORAL CONDUCTING (2-2-2). Laboratory for development of skills relating to the performance of traditional and modern works. Emphasis on score reading and analysis. Participation in an approved instrumental or choral ensemble is required.

603. BRASS INSTRUMENTS TECHNIQUES (1). LEC. 1, LAB. 3. Course designed to work out specific problems with graduate students in furthering their knowledge of and skill on brass instruments. Participation in an approved instrumental organization is required. May be repeated for a maximum of 3 hours credit.

604. WOODWIND INSTRUMENTS TECHNIQUES (1). LEC. 1, LAB. 3. Course designed to work out specific problems with graduate students in furthering their knowledge of and skill on woodwind instruments. Participation in an approved instrumental organization is required. May be repeated for a maximum of 3 hours credit.

605. PERCUSSION INSTRUMENTS TECHNIQUES (1). LEC. 1, LAB. 3. Course designed to work out specific problems with graduate students in furthering their knowledge of and skill on percussion instruments. Participation in an approved instrumental organization required. May be repeated for a maximum of 3 hours credit.

606. MUSIC IN THE ARTS (4). Music in relation to architecture, the plastic arts, and poetry.

607. CHORAL LITERATURE OF THE CLASSIC, ROMANTIC AND MODERN PERIODS (4). The styles, forms, and performance practices of choral music from the Classic, Romantic and Modern periods, working primarily with scores of representative works. Participation in an approved choral organization is required.

- 608. CHORAL ARRANGING (4).** Pr., departmental approval. Advanced Arranging for various choral combinations. Participation in an approved choral organization is required.
- 609. SEMINAR IN 20TH CENTURY MUSIC (3-3-3).** Pr., departmental approval. Analysis and comparison of representative works of principal composers of the first half of the 20th century. Specific works chosen for each quarter. (May be repeated for a maximum of 9 hrs. credit.)
- 610. BAND ARRANGING (4).** Pr., departmental approval. Advanced arranging for various band organizations. Participation in band is required.
- 611. ORCHESTRAL ARRANGING (4).** Pr., departmental approval. Advanced arranging for various orchestral organizations. Participation in orchestra is required.
- 612. ACOUSTICS IN MUSIC (3).** Pr., departmental approval. The physics of sound as related to music.
- 634. MUSIC HISTORY SEMINAR (2).** Pr., departmental approval. Different aspects of the history of music. Specific research areas chosen each quarter. May be repeated for a maximum of 6 hrs. credit.
- 644. REPERTOIRE SEMINAR (2).** Pr., departmental approval. Music literature in the student's major area through analysis & performance. May be repeated for a maximum of 6 hrs. credit.
- 650-651-652. TECHNIQUES OF PRIVATE INSTRUMENTAL INSTRUCTION (2-2-2).** Pr., departmental approval. Analysis of teaching and supervised teaching.
- 653-654-655. TECHNIQUES OF PRIVATE INSTRUCTION IN VOICE (2-2-2).** Analysis of teaching and supervised teaching.
- 660. INDEPENDENT STUDY IN PERFORMANCE (3).** Pr., departmental approval. Advanced private study and public performance each quarter. May be repeated for credit not to exceed 12 hours.
- 681-682-683. INDEPENDENT STUDY IN (A) COMPOSITION, (B) ANALYSIS (2-3, 2-3, 2-3).** Pr., departmental approval.
- 697. QUALIFYING RECITAL.**

Music Education (MED)

Students majoring in music education must demonstrate functional keyboard skills appropriate to their chosen area of concentration. The keyboard proficiency examination is taken prior to enrollment in any MED course. Additional degree requirements are available from the Dean of Education.

- 102. ORIENTATION FOR MUSIC EDUCATION STUDENTS (1).** Helps students to understand teacher education and teaching as a profession as well as become acquainted with the preparation program in music education.
- 304. MUSIC AND RELATED ARTS (3-5).** Pr., MU 371 or equivalent. Musical, rhythmic, and artistic activity program in the context of laboratory experiences with children. May be taken for a maximum of 3 hours credit by music education majors.
- 394. TEACHING ELEMENTARY INSTRUMENTAL MUSIC (3). LEC. 2, LAB. 2.** Pr., 6 hours of class instruments. Methodology, materials, and organization for beginning instrumental music programs; includes laboratory experiences with children.
- 396. EARLY CHILDHOOD AND ELEMENTARY MUSIC PROGRAMS (3). LEC. 2, LAB. 2.** Pr., MED 304 or COI. Methodology, materials, and activities for music programs in grades n-6; includes laboratory experiences with children.
- 425. PROFESSIONAL INTERNSHIP (15).** Pr., senior standing, admission to Teacher Education prior to internship, appropriate professional courses. Provides supervised, on-the-job experiences in school, college, or other appropriate setting. These experiences will be accompanied by regularly scheduled discussion periods designed to provide positive evaluation and analysis of the intern experience.
- 446. DIRECTED INDEPENDENT STUDY (1-10).** Planned individual inquiry including evaluation by professor and student at regular intervals.
- 450. SPECIAL TOPICS IN MUSIC EDUCATION (1-5).** Cooperative pursuit of selected concepts and theories. May be repeated not to exceed 6 hours.
- 495. PRACTICUM (1-10).** Experiences designed to allow individual students to relate theory to practice.

ADVANCED UNDERGRADUATE AND GRADUATE

- 593. MATERIALS AND ORGANIZATION OF SCHOOL ORCHESTRAS (3).** Pr., COI. Administrative procedures, instructional strategies, and materials for intermediate and advanced school orchestra programs.
- 594. MATERIALS AND ORGANIZATION OF SCHOOL BANDS (3).** Pr., COI. Administrative procedures, instructional strategies, and materials for intermediate and advanced school band programs.
- 595. MATERIALS AND ORGANIZATION OF SCHOOL CHOIRS (3).** Pr., COI. Administrative procedures, instructional strategies, and materials for school choral programs.
- 596. CURRENT TRENDS IN EARLY CHILDHOOD AND ELEMENTARY MUSIC (4).** Pr., MED 396 or COI. Advanced study and evaluation of skills, techniques, materials, theories, and trends in music teaching.

- 597. MATERIALS AND ORGANIZATION OF GENERAL MUSIC PROGRAMS (4).** Pr., MED 396 or COI. Scope and sequence of school general music programs with an emphasis on materials and methodologies for post-elementary programs.

GRADUATE

- 625. INTERNSHIP (5-15).** Provides advanced students with supervised, on the job experiences in a school or college or other appropriate setting. These experiences will be accompanied by regularly scheduled on-campus discussion periods designed to provide positive evaluation and analysis of the intern experience.
- 646. DIRECTED INDEPENDENT STUDY (1-6).** Special study in which the student's learning efforts are guided toward desired objectives. Includes evaluation by professor and student at regular intervals.
- 650. SEMINAR IN AREAS OF SPECIALIZATION (3-10).** May be repeated for credit not to exceed 10 hours. Provides an opportunity for advanced graduate students and professors to pursue cooperatively selected concepts and theoretical formulations.
- 651. RESEARCH STUDIES IN EDUCATION IN AREAS OF SPECIALIZATION (5).** Review, analysis, and interpretation of available research with emphasis on designing new research to meet the changing needs of the school.
- 652. CURRICULUM AND TEACHING IN AREAS OF SPECIALIZATION (5).** Teaching practices and reappraisal of selecting experiences and content for curriculum improvement.
- 653. ORGANIZATION OF PROGRAM IN AREAS OF SPECIALIZATION (5).** Program organization, and development of basic and supplementary materials for guiding teachers, faculties, and school systems in the continuous improvement of curriculum and teaching practices.
- 654. EVALUATION OF PROGRAM IN AREAS OF SPECIALIZATION (5).** Evaluation and investigation of teaching effectiveness with attention also given to the utilization of human material resources and the coordination of areas of specialization.

Prerequisites for the 651, 652, 653, and 654 courses are 18 hours of appropriate subject matter and 36 hours of psychology and professional education.

Naval Science (NS)

- 111. ORIENTATION TO THE NAVY AND MARINE SCIENCES (1).** LEC. 1, LAB. 2. Fall. Introduction to basic areas of Naval Science including such subjects as: uniforms and insignia, military courtesy, discipline, components and supporting elements of the Navy, logistics, communications, security, Naval Intelligence, oceanographic research.
- 112-113. NAVAL SHIPS SYSTEMS I & II (2-2).** LEC. 2, LAB. 2. I Winter, II Spring. Principles of ship design, constr., and stability. Study of impaired stability and damage control. Shipboard auxiliary systems, basic electricity, infr. to thermodynamics and steam cycle as applied to Naval propulsion systems. Advanced propulsion and ship design including nuclear and gas turbine engines.
- 211. SEAPOWERS AND MARITIME AFFAIRS (2).** LEC. 2, LAB. 2. Fall. A seminar course dealing with broad principles, concepts, and elements of seapower and maritime affairs with application to the United States and other world powers.
- 212-213. NAVAL WEAPONS I & II (2-2).** LEC. 2, LAB. 2. I Winter, II Spring. Introduction to weapons systems through a study of fund. principles of sensor, tracking, computational and weapons delivery subsystems. Missile and underwater battery systems, practical applic. of various systems.
- 311-312. NAVIGATION I & II (3-3).** LEC. 3, LAB. 2. I Fall, II Winter. The theory and principles of piloting involving the use of visual and electronic aids. The theory, principles and procedures of celestial navigation.
- 313. NAVAL OPERATIONS (3).** LEC. 3, LAB. 2. Spring. Navy tactical formations and dispositions, relative motion, Rules of the Road, maneuvering board and communications.
- 321-322-323. EVOLUTION OF WARFARE (2-2-2).** LEC. 2, LAB. 2. Fall, Winter, Spring. Forms of warfare practices to identify historical continuity and change in the evolution of warfare. Demonstrates concepts of strategy, examines great captains and military organizations of history to discover ingredients of their success and explores the impact of historical precedent and technological change on politico-military thought and action.
- 411-412-413. PRINCIPLES OF NAVAL ORGANIZATION LEADERSHIP AND MANAGEMENT. (3-3-3).** LEC. 3, LAB. 2. Fall, Winter, Spring. Various tools and methods of leadership. The UCMJ from the division officer's perspective. Naval personnel administration, material mgt., and correspondence.
- 421-422-423. AMPHIBIOUS WARFARE (2-2-2).** LEC. 2, LAB. 2. Fall, Winter, Spring. Amphibious warfare prior to WW II through Korean conflict, definitions of concept, examination of doctrinal origins, evolution of amphib warfare and tactics and techniques, and the current structure of the Fleet Marine Force and its equipment.

Nursing (NUR)

- 301. PROCESSES FUNDAMENTAL TO NURSING (10).** LEC. 7, LAB. 9. Pr. completion of Pre-Nursing Science Program. Basic course emphasizing the nursing process and fundamental concepts and skills. Pre-requisite to all other nursing courses.

311. **MEDICAL-SURGICAL NURSING (10). LEC. 5, LAB. 15.** Pr., NUR 301. Prevalent health problems which influence people to seek health care. Varied clinical sites.
321. **MATERNITY NURSING (10).** Pr., NUR 301, 311. Nursing care of individuals/families to facilitate adaptation during the antepartal, intrapartal and postpartal aspects of childbearing.
331. **PEDIATRIC NURSING (10). LEC. 5, LAB. 15.** Pr., NUR 301, 311. Explores the nurse-child-parent relationship. Nurse role components are carried out through deliberative actions of the nursing process. Explanation of behavior of children in response to stressors affecting health status.
340. **DIRECTIONS IN NURSING (3).** Pr., NUR 301. Past, present and future directions in nursing. Will explore concepts of accountability, ethical issues and the health continuum.
380. **PHARMACOLOGY IN NURSING (4).** Pr., NUR 301 or COI. The therapeutic effects, dosages, side effects, toxicities and interactions of drugs.
412. **PSYCHIATRIC/MENTAL HEALTH NURSING (10).** Pr., NUR 301, 311, 321, 331. Nursing intervention to facilitate successful psychosocial adaptations to stressors in human relations that may impair health.
422. **COMMUNITY HEALTH NURSING (10). LEC. 5, LAB. 15.** Pr., NUR 301, 311, 321, 331. Nursing process used by students to facilitate maintaining, attaining, and regaining optimal health status by individuals and groups in ambulatory care settings.
442. **ADVANCED MEDICAL-SURGICAL NURSING (7). LEC. 3, LAB. 12.** Pr., NUR 301, 311. Man's adaptations to severe physiological stress; emphasizes adaptation in adult developmental states, the nursing process; and therapeutic interpersonal relationships.
450. **SENIOR SEMINAR (2).** Pr., senior standing. Student has opportunity to explore socialization adaptation necessary for entry into the graduate professional nurse role.
482. **NURSING RESEARCH (3). LEC. 3.** Pr., SY 370, NUR 301, 311, 321 & 331. Provides opportunity to explore the research process as systematic means for contributing to nursing knowledge. Processes of conducting research are examined.
495. **MANAGEMENT IN NURSING (5). LEC. 2, LAB. 9.** Pr., senior standing. Affords opportunity to assume responsibility for managing health care team. Opportunity to practice management skills is provided in varied health care settings.

Nutrition (NN)

(Interdepartmental Graduate Program)

651. **NUTRITION I. THE MACRO NUTRIENTS (5).** Pr., ADS-CH 519, ZY 524. The interrelationships among the energy-furnishing and structural nutrients, including carbohydrates, lipids and proteins. The digestion, absorption, transport and metabolism of these nutrients.
652. **NUTRITION II. THE MICRO NUTRIENTS (5).** A continuation of NN 651 with emphasis on the role of vitamins and minerals. A study of the interrelationships of nutrients and hormones. Effects of excesses and deficiencies on the organism.
653. **NUTRITION III. ASSESSMENT OF NORMAL AND ABNORMAL NUTRITIONAL STATES (5).** A continuation of NN 652, with emphasis on assessment of nutritional status of man and animals including an evaluation of standards, the human nutrition survey, clinical problems in nutrition, and hereditary and other disorders in metabolism.
654. **EXPERIMENTAL NUTRITION (5). LEC. 2, LAB. 6.** Pr., ADS-CH 519 and BY 501. Acquaints the student with the animal feeding experiment as a basis for research in nutrition. Includes balance studies and proximate analysis.
655. **NUTRITION SEMINAR (1).** Required of all students in the interdepartmental program in Nutrition. Must be taken three quarters.
656. **DIRECTED READINGS IN NUTRITION (3-5).** The development of nutrition as a science and a critical analysis of the classic and current literature in nutrition.

Suggested courses offered in other departments. For related courses at 500 level, see departmental listings.

- ADS 607. **COMPARATIVE ANIMAL NUTRITION.**
- ADS 614. **MINERALS AND VITAMINS.**
- ADS 615. **RUMINANT NUTRITION.**
- ADS 641. **PROTEINS.**
- ADS 642. **LIPIDS.**
- ADS 643. **ENZYMES.**
- FAA 621. **FISH NUTRITION.**
- NF 624. **ADVANCED HUMAN NUTRITION I.**
- NF 625. **ADVANCED HUMAN NUTRITION II.**
- NF 626. **ADVANCED HUMAN NUTRITION III.**

- PH 510. **ADVANCED POULTRY NUTRITION.**
 VPH 601. **MEDICAL PHYSIOLOGY I.**
 VPH 602. **MEDICAL PHYSIOLOGY II.**
 VPH 638. **PHYSIOLOGY OF DIGESTION.**
 VPH 639. **SMALL ANIMAL NUTRITION.**
 ZY 646. **RENAL AND DIGESTIVE PHYSIOLOGY.**

Nutrition and Foods (NF)

Professor Fick, *Head*

Associate Professors Chastain and Clark

Assistant Professors Craig-Schmidt, Keith, Svacha, and Walker

Instructors Price, Meyer, and Strawn

104. **PRINCIPLES OF FOOD PREPARATION (5). LEC. 3, LAB. 4.** Each quarter. Basic principles underlying the fundamental processes and standards of food preparation.
112. **NUTRITION AND MAN (3).** Each quarter. The fundamentals of nutrition and the influence of socio-economic and cultural patterns of man on fulfilling nutritional needs.
204. **MEAL MANAGEMENT (5). LEC. 4, LAB. 3.** Pr., NF 104 and 112. Each quarter. Planning of meals with emphasis on scientific principles of nutrition, aesthetic value, management of time and the food budget on various economic levels.
307. **SURVEY OF DIETETICS (2). LAB. 1, LEC. 3.** Role and professional conduct of dietitians in various institutions. Open only to students enrolled in the Coordinated Dietetics Program.
312. **CHILD NUTRITION (3). LEC. 2, LAB. 2.** Pr., NF 112. Application of nutrition in the development of the child from conception through adolescence.
318. **NUTRITIONAL BIOCHEMISTRY (5). LEC. 4, LAB. 3.** Pr., CH 203. Chemistry of carbohydrates, fats, proteins, vitamins, and minerals applied to human nutrition.
324. **FOOD PRESERVATION (3). LEC. 2, LAB. 2.** Food spoilage mechanisms and their prevention.
346. **FOOD SERVICE ORGANIZATION AND MANAGEMENT (5).** Pr., NF 204. Management principles, methods of control and personnel management related to quantity food service operations. Credit will not be given for both NF 346 and NF 356.
356. **FOOD SERVICE ADMINISTRATION (10). LEC. 5, CLINICAL EXPERIENCE 15.** Pr., NF 204. The processes of planning, organizing, directing, evaluating and controlling, applied to food service systems. Experiences in cooperating facilities.
358. **COMMUNITY AND FAMILY HEALTH (3). LEC. 2, LAB. 2.** Facilities, services, and agencies within the community which affect health. Field trips.
362. **PROBLEMS IN COMMUNITY NUTRITION (3).** Pr., NF 112, or equivalent. Environmental factors that influence the nutritional level of people.
372. **FUNDAMENTALS OF NUTRITION (3).** Pr., CH 203, BI 101. Principles of human nutrition and factors influencing food requirements.
382. **PRINCIPLES OF NORMAL NUTRITION I (5). LEC. 3, LAB. 4.** Pr., NF 318 or equivalent. Physiological and biochemical bases of nutrient needs of the healthy individual. Methods of assessing nutritional adequacy of the diet.
392. **PRINCIPLES OF NORMAL NUTRITION II (5). LEC. 3, LAB. 4.** Pr., NF 382. Continuation of NF 382.
404. **QUANTITY FOOD PREPARATION (5). LEC. 3, LAB. 4.** Pr., junior standing and NF 204. Menu planning, preparation and sanitation in institutional service of food. Includes use, operation, and maintenance of equipment. Laboratory experience in university food service facilities. Credit will not be given for both NF 404 and NF 516.
408. **INDEPENDENT OR FIELD STUDY (3-8).** Laboratory or field experiences approved and supervised by a faculty member. May be repeated for a maximum of 8 credit hours.
432. **MEDICAL DIETETICS (10). LEC. 5, CLINICAL EXPERIENCE 15.** Pr., NF 392. Principles of nutrition related to disease. Open only to students enrolled in Coordinated Dietetics Program. Experiences in cooperating institutions.
436. **FOOD SERVICE SYSTEMS (5). LEC. 4, LAB. 2.** Pr., junior standing. Planning, organizing, directing, evaluating, and controlling the functions and operations of food service systems.
442. **ADVANCED DIETETICS (15). LEC. 4, CLINICAL EXPERIENCE 33.** Pr., NF 432. Emphasis on current research in dietetics and its clinical application. Experience in cooperating facilities.

446. **CATERING (3). LEC. 2, LAB. 3.** Pr., NF 204. Types of catered food-service functions: planning, pricing, organization, management, equipment, and service.

ADVANCED UNDERGRADUATE AND GRADUATE

502. **DIET THERAPY (5). LEC. 4, LAB. 2.** Pr., NF 392. Application of principles of nutrition to various periods of stress and as a therapeutic aid in treatment of disease.
516. **QUANTITY FOOD PREPARATION (10), LEC 5, CLINICAL EXPERIENCE 15.** Pr., junior standing and NF 204. Principles of menu planning, preparation, and sanitation in institution food service. Use, operation and maintenance of food service equipment. Experience in cooperating facilities.
522. **COMMUNITY NUTRITION (10), LEC. 5, CLINICAL EXPERIENCE 15.** Pr., NF 392 or COI. Assessment of community nutritional status and methods used to effect change. Experiences in cooperating facilities.
562. **NUTRITION AND PHYSICAL PERFORMANCE (4).** Pr., ZY 251, NF 318 or equivalent, and junior standing. The effects of nutrition on human physical performance and athletic ability.
564. **EXPERIMENTAL FOODS (5), LEC. 2, LAB. 6.** Pr., NF 104 and CH 203. Effects of variation of ingredients and treatments on quality characteristics of foods.
572. **NUTRITION AND SOCIETY (5).** Pr., satisfactory course in nutrition and COI. Environmental practices that exist in a modern society. Credit will not be given for both NF 522 and NF 572.
578. **MODERN VIEWS OF NUTRITION (3).** Pr., satisfactory course in nutrition. Current concepts in nutrition and related fields.
582. **TEACHING NUTRITION TO CHILDREN IN SCHOOLS (3).** Pr., one nutrition course and junior standing. Methods for teaching nutrition principles and motivating changes in food habit of students in grades K-12. Focuses on nutrition education research as well as specific activities and objectives for various age groups.
588. **INTERNATIONAL NUTRITION (3).** Pr., satisfactory course in nutrition. Nutritional status of world population and local, national, and international programs for improvement.
592. **NUTRITION IN THE LIFE CYCLE (5).** Pr., NF 392 and junior standing. Metabolic and clinical approach to nutrition throughout the life cycle with emphasis on groups for whom nutrition is more crucial.

GRADUATE

601. **SEMINAR IN NUTRITION AND FOODS (1-5).** Each quarter. May be taken more than one quarter for a maximum of 5 credit hours.
605. **METHODS OF RESEARCH IN HOME ECONOMICS (3).** Research and investigation methods applicable to the various areas of Home Economics. Required of all graduate students in Nutrition and Foods.
609. **SPECIAL PROBLEMS IN NUTRITION AND/OR FOODS (2-5).** Pr., COI. May be taken more than one quarter.
620. **ADVANCED FOODS I (5).** Pr., NF 564 or equivalent. Food quality assessment and chemistry of carbohydrates in foods.
621. **ADVANCED FOODS II (5).** Pr., NF 564 or equivalent. Chemistry of fats and proteins in foods.
622. **PROBLEMS IN FOOD PRESERVATION (5).** Pr., BY 220 or 300. Various problems which grow out of advanced study of preservation of foods. These problems are subjects for minor research.
623. **READINGS IN NUTRITION AND/OR FOODS (5-10).** Pr., NF 382, CH 203. A critical survey of current literature. May be taken more than one quarter.
624. **ADVANCED HUMAN NUTRITION I (5).** Pr., NF 392, 318, or equivalents. Carbohydrates, fats and proteins. Consideration will be given to the biochemical and physiological functions of these nutrients and their interrelationships in human nutrition.
625. **ADVANCED HUMAN NUTRITION II (5).** Pr., NF 392, 318, or equivalents. Vitamins and minerals. Consideration will be given to the biochemical and physiological functions and interrelationships of these nutrients in human nutrition.
626. **ADVANCED HUMAN NUTRITION III (5).** Pr., NF 624 and 625, or equivalents. Assessment of human nutritional status. Dietary, biochemical and clinical methods of appraisal, and programs for improvement of status.
628. **RESEARCH METHODS IN NUTRITION (5).** A course designed to acquaint graduate students with modern laboratory techniques used in Human Nutrition Research.
699. **RESEARCH AND THESIS. CREDIT TO BE ARRANGED.** Required of all students under the Thesis Option in any field.

Pharmaceutical Sciences (PY)

Professors Williams, Head, Coker, Darling, and Wilken
Associate Professors Beebe, Belmonte, Born, Clark, and Hamrick
Assistant Professor Ravis
Instructors Crisone and Davidson
Research Associate Yang

301. **PHARMACEUTICS I (5). LEC. 4, LAB. 3.** Pr., PCS 260 or coregistration. Physical-chemical principles are applied to develop an understanding of solid dosage forms and homogeneous liquid dosage forms. Selected official preparations are considered from this viewpoint.
302. **PHARMACEUTICS II (5). LEC. 4, LAB. 3.** Pr., PY 301. A continuation of PY 301 dealing with heterogeneous and plastic systems and the physical and chemical principles applicable to plastic and polyphasic dosage forms including suspensions, colloids, mixtures, ointments, creams, emulsions and lotions.
316. **MODERN METHODS OF DRUG ANALYSIS (4). LEC. 3, LAB. 3.** Pr., CH 301. Theory and application of physical and chemical methods with special emphasis on the use of chromatography, instrumentation, and nonaqueous systems in the analysis of pharmaceutical products.
401. **PHARMACEUTICS III (5). LEC. 3, LAB. 6.** Pr., PY 302. Influence of formulation on the therapeutic activity of a drug in a dosage form, emphasizing effects of dosage forms on biological response, physiological factors which may affect the drug contained in the dosage form and the dosage form of the drug itself.
402. **PHARMACOKINETICS (3). LEC. 3.** Pr., PY 401, PC 448. Study and characterization of the time course of drug absorption, distribution, metabolism, and excretion and the relationship of these processes to the intensity and time course of therapeutic and adverse effects of drugs.
403. **PRESCRIPTION COMPOUNDING AND DISPENSING (3). LEC. 2, LAB. 3.** Pr., PY 401. An introduction to the prescription, its interpretation, handling, compounding and dispensing together with pertinent calculations and techniques.
420. **MEDICINAL CHEMISTRY I (5).** Pr., CH 302, PY 316, ZY 561; coreq., PY 531. Relationship of biodynamic behavior to the chemical reactivity and physical properties of therapeutic agents. The mechanism of action, classification and structure-activity relationships of drugs in terms of their physical and chemical properties.
421. **MEDICINAL CHEMISTRY II (4).** Pr., PY 420, 531; coreq., PY 432, 532. A continuation of PY 420.
422. **MEDICINAL CHEMISTRY III (5).** Pr., PY 421, 532; coreq., PY 433, 533. A continuation of PY 421.
432. **CHEMICAL PHARMACOLOGY LABORATORY (1). LAB. 3.** Pr., PY 420, 531; coreq., PY 421 and 532. Laboratory exercises to demonstrate drug action, mechanism, and structure-activity relationship.
433. **CHEMICAL PHARMACOLOGY LABORATORY (1). LAB. 3.** Pr., PY 421, 532; coreq., PY 422 and 533. Continuation of PY 432.
434. **NUCLEAR PHARMACY (3). LEC. 2, LAB. 3.** Pr., PY 532. Use of radiolabeled material in the diagnosis and treatment of disease, including the nature of radiation and its interaction with biological material, measurement of radioactivity, preparation of dosage forms, safe handling of isotopes and legal requirements of radiopharmacy.
436. **CANCER CHEMOTHERAPY (3). LEC. 3.** Pr., PY 533, COI. Consideration of theoretical and practical aspects of drug use in therapy of neoplasms.
495. **SPECIAL PROBLEMS (1-3).** Pr., COI. may be repeated for a maximum of 8 credit hours.
510. **ADVANCED PHARMACEUTICS (3).** Pr., PY 401. Includes the basic physico-chemical and kinetic aspects which underlie the makeup and subsequent action of pharmaceutical dosage forms.
511. **ELEMENTS OF PHARMACEUTICAL MANUFACTURING (5). LEC. 2, LAB. 9.** Pr., PY 401. Manufacturing procedures, operation and principles. In the laboratory selected pilot scale production problems are carried out to completion including control and testing of finished products.
512. **INTRAVENOUS ADMIXTURES AND STERILE PREPARATIONS (3). LEC. 2, LAB. 3.** Pr., PY 401. Principles involved in the preparation of IV additives and sterile dosage forms in hospitals, clinics, and professional pharmacies.
531. **PHARMACOLOGY I (5).** Pr., PC 346, 347 coreq., PY 420. Biochemical and physiological effects, action mechanism, absorption, distribution, biotransformation, excretion, and therapeutic and other uses of drugs.
532. **PHARMACOLOGY II (5). LEC. 5.** Pr., PY 420, 531; coreq., PY 421, 432. Continuation of PY 531.
533. **PHARMACOLOGY III (4). LEC. 4.** Pr., PY 421, 532; coreq., PY 422, 433. Continuation of PY 532.
534. **TOXICOLOGY LABORATORY (1). LAB. 3.** Pr., ZY 561, PY 531 or COI. coreq., PY 535. Exercises in acute and chronic toxicity, isolation, identification and analysis of metals, organic acids and bases from biological specimens.
535. **TOXICOLOGY (5).** Pr., ZY 561, PY 531 or COI. The basic science of poisons including the acute and chronic toxicology of common environmental, agricultural, industrial, commercial, medicinal and natural products.
536. **CELLULAR PHARMACOLOGY (5).** Pr., ZY 561, CH 302. Cytological basis of pharmacodynamics including metabolic energy transformation, protein synthesis, and cellular control systems as related to drug actions.

537. **FUNDAMENTALS OF BIONUCLEONICS (3). LEC. 2, LAB. 3.** Pr., PS 206, COI and second professional year standing. Theoretical and practical application of trace level radioactivity for research application to pharmacy and allied sciences.
538. **PHARMACEUTICAL METHODOLOGIES (5). LEC. 2, LAB. 9.** Pr., CH 302, ZY 561. Research principles and techniques utilized in evaluation of drug action, analysis and usage.

GRADUATE

601. **PARENTERAL PREPARATIONS (5). LEC. 3, LAB. 6.** Pr., PY 401 and COI. Theory, preparation and testing of various medicinal preparations intended for injection into the body. Pharmaceutical principles are applied to problems of filtration, sterilization, isotonicity, hydrogen ion concentration and aseptic techniques.
602. **TABLET MANUFACTURE (5). LEC. 2, LAB. 9.** Pr., PY 401. Essentials in the manufacture, coating and evaluation of compressed tablets.
603. **PRODUCT DEVELOPMENT (5). LEC. 3, LAB. 6.** Pr., PY 401. Formulation, evaluation and control techniques as well as actual manufacture of products of pharmaceutical and cosmetic nature.
604. **PHARMACEUTICAL LITERATURE (1).** Literature searching techniques, services, abstracting and writing, designed for the beginning graduate student in the pharmaceutical sciences.
608. **ADVANCED BIOPHARMACEUTICS (5). LEC. 3, LAB. 6.** Pr., COI. The relationship between physical and chemical properties of a drug and its dosage forms and the biological effects elicited following administration together with the relevant pharmacokinetics.
610. **COLLOIDAL AND INTERFACIAL PHENOMENA (5). LEC. 4, LAB. 3.** Pr., CH 508 or equivalent and COI. Interfacial and colloidal phenomena of chemical, biological, and pharmaceutical significance.
- 620-621-622. **CHEMISTRY OF SYNTHETIC DRUGS (5-5-5).** Pr., PY 422 or COI. Historical background, pertinent literature, organic name reactions, nomenclature, relation of chemical structure and physical properties to biological activity, isosternism, metabolite antagonism, enzyme inhibition, and exhaustive consideration of the chemistry and biological activity of the various therapeutic classes.
- 623-624-625. **SYNTHESIS OF DRUGS (5-5-5). LEC. 2, LAB. 9.** Coreq. PY 620-621-622 or COI. Laboratory procedures in the synthesis of intermediates and representative compounds studied in PY 620-621-622.
- 626-627. **ANALYTICAL AND CONTROL METHODS (5-5). LEC. 3, LAB. 6.** Pr., PY 316 or COI. The principles and techniques of analysis as applied to the various therapeutic classes.
628. **STEROID CHEMISTRY (5).** Pr., PY 620 or COI. Structure, determination, chemistry, synthesis and structure relationships of steroids of pharmacological and pharmaceutical importance.
629. **ALKALOID CHEMISTRY (5).** Pr., PY 620 or COI. Structure determination, chemistry and synthesis of alkaloids with emphasis on the alkaloids of pharmaceutical importance.
630. **FORENSIC AND ANALYTICAL TOXICOLOGY (5). LEC. 3, LAB. 6.** Pr., PY 535, PY 316 or equivalent. The medicolegal aspects of drugs and chemicals commonly encountered by humans and the modern methods used in their separation and identification. (Changes in course title, prerequisite, credit and description.)
- 631-632. **PSYCHOPHARMACOLOGY (5-5). LEC. 4, LAB. 3.** Pr., PY 536. Effect of neurotropic and psychotropic agents upon reverberatory circuits, chemical transmitters, neural amines, and metabolic energy systems; measures of rate of behavioral change; critique of behavioral screening techniques.
633. **BIOASSAY (5). LEC. 4, LAB. 3.** Pr., MH 267 or an equivalent course in statistics. Statistical basis for design of experiments and analysis of data in pharmacological quantitation.
637. **PHARMACOLOGY SEMINAR (1-3).** May be repeated for a maximum of 3 hrs. credit. Pr., graduate standing.
638. **TOXICOLOGY SEMINAR (1-3).** Pr., graduate standing. Students are expected to present reviews of current literature and case histories. This will be followed with discussion by students and faculty.
- 650-651. **ADVANCED TOXICOLOGY (5-5). LEC. 3-3, LAB. 6-6.** Pr., PY 535. Toxicological principles, testing procedures, legal requirement, mechanisms of action and treatment of medicinal, environmental and industrial toxicants. (Changes in prerequisite and course description.)
660. **HETEROCYCLIC MEDICINAL CHEMISTRY (5).** Pr., COI. The chemical nature and behavior of heterocyclic moieties which are either themselves of medicinal significance or are components possessing therapeutic properties.
680. **GRADUATE SEMINAR (1).** Pr., admission to Graduate School. Required of all pharmacy graduate students each quarter.
695. **SPECIAL PROBLEMS (2-5).** Pr., COI. May be repeated for a maximum of 8 hours.
699. **RESEARCH AND THESIS. CREDIT TO BE ARRANGED.**

Pharmacy Care Systems (PCS)

Professors Barker, Head, Cooper
Associate Professors Gibson and Newton
Assistant Professor Pearson
Instructors Burnett and Felkey

Adjunct Assistant Professors Henry, King, and Swensson

261. **HISTORY AND ORIENTATION (3). LEC. 3.** Pr., PPY or PY standing. Introduction to delivery of health care services with emphasis on the role of the profession of Pharmacy.
360. **PHARMACY CONVOCATION (0).** Third professional year standing. Professional topics discussed by visiting lecturers, faculty, and students.
361. **DRUG LITERATURE ANALYSIS (3). LEC. 3.** Coreq., ZY 561, CH 302, and PY 302. Evaluation of current therapeutic and drug literature using the scientific method models.
461. **HOSPITAL PHARMACY I (3).** Pr., PY 302. The development of hospitals, their place in society, importance and place of pharmacy in hospitals, administrative and policy making aspects together with interdepartmental relationships.
462. **HOSPITAL PHARMACY LABORATORY (1). LAB. 3.** Pr., PY 401 and COI. Course may be repeated for a maximum of three credit hours. Hospital pharmacy experience is obtained in the environment of participating hospitals. Students are expected to furnish transportation for this elective course.
463. **HOSPITAL PHARMACY II (3).** Pr., PCS 461. The organization, staffing, services, legal requirements, and development of hospital pharmacy departments to provide drug use control, education, and research by hospital pharmacists.
464. **PHARMACY JURISPRUDENCE (5).** Pr., MN 207, PY 421, PCS 361, PY 532. Basic legal and ethical principles of pharmaceutical patient care and their effect on the patient drug use process.
465. **PHARMACY OPERATING SYSTEMS (5). LEC. 3, LAB. 6.** Pr., PY 401, PCS 464, MN 207. Methods of systems and decision analysis applied to problems of optimizing the use of money, equipment, drug products, information and personnel within community and institutional environments.
466. **ENVIRONMENT OF DRUG DELIVERY (3).** Pr., PCS 261. Basic political, legal, social, ethical and economic principles of delivering the drug component of health care to patients.
470. **CLINICAL DRUG TRIALS (3). LEC. 3.** Pr., PCS 361, 473. The design, planning, and execution of protocols for Phase I, II, and III clinical drug trials, including the relative merits of prospective and retrospective methodologies for various disease states.
471. **PROFESSIONAL COMMUNICATIONS I (3). LEC. 2, LAB. 3.** Pr., PY standing. The nature, purpose and process of communication for the Health Professional. Interviewing, detailing, advertising, and patient counseling are covered along with patient education and information dissemination.
472. **PROFESSIONAL COMMUNICATIONS II (3). LEC. 2, LAB. 3.** Pr., PCS 471. Continuation of PCS 471.
473. **CLINICAL BIostatISTICS (3). LEC. 3.** Pr., PCS 361. Biostatistical analysis of clinical data including data collection protocols; psychological and biophysical medical assessment; descriptive and inferential statistics.
495. **SPECIAL PROBLEMS (1-3).** Pr., COI. Individualized investigation of pharmacy care systems problems as related to the delivery of health care services.
562. **INTRODUCTION TO MEDICATION INFORMATION SYSTEMS. (3). LEC. 2, LAB. 3.** Pr., MN 207. Computer principles and methods of retrospective review of drug indications, contraindications, warnings, precautions, adverse reactions, dosages and administration to determine conformance to Pharmaceutical Services Committee Standards.
563. **PUBLIC HEALTH (5). LEC. 4, LAB. 3.** Pr., BY 302, PCS 361 or equivalent. Epidemiological study of diseases of man. A survey of the public health and preventive medicinal programs of federal, state, local and private agencies is included.
564. **DRUG DISTRIBUTION SYSTEMS (5). LEC. 4, LAB. 3.** Pr., PCS 562, PCS 465, PCS 464. Application of the principles of cybernetics to drug distribution systems in hospitals, nursing homes, and other inpatient facilities.

GRADUATE

609. **INSTITUTIONAL PHARMACY (5). LEC. 4, LAB. 3.** Pr., PC 448, PCS 461, and COI. Comprehensive presentation of the development, responsibilities, classification, organization and administration of the pharmacy in hospitals, nursing homes, etc., from the viewpoint of the administrative pharmacist. Provides a survey of the responsibilities of the director of pharmacy service in a hospital.
680. **GRADUATE SEMINAR (1).** Pr., admission to Graduate School. Required of all pharmacy graduate students each quarter.
681. **HOSPITAL PHARMACY ADMINISTRATION (3).** Pr., PCS 609 or COI. Administrative and policymaking procedures regarding hospital economics, planning, staffing, communications, directing, controlling, design of facilities and operations. Provides an understanding of the socio-economic aspects of hospital pharmacy practice and competence in selected administrative skills needed by administrative pharmacists.

- 682. RESEARCH METHODS AND DESIGN IN HEALTH SCIENCES I (3).** Pr., BY 501 or equivalent or COI. Description and application of the scientific methods to research problems unique to the health care field, including problem formulation, operational definitions, hypotheses, validity, reliability, research design, data collection by observation, questionnaires, and interviews; cost effectiveness analysis, clinical drug investigations, critiquing research.
- 683. RESEARCH METHODS AND DESIGN IN HEALTH SCIENCES II (3).** Pr., PCS 682. Design and analysis of research problems in the health care field. The role of operational definitions, concept and construct linkage, hypotheses, and control in causal or covarying designs.
- 684. MEDICATION INFORMATION SYSTEMS (3).** Pr., PCS 465 or COI. Design, control, and planning of information systems used to implement medication orders and manage the medication distribution system.
- 695. SPECIAL PROBLEMS (2-5).** Pr., COI; may be repeated for a maximum of 8 credit hours.
- 699. RESEARCH AND THESIS. CREDIT TO BE ARRANGED.**

Pharmacy, Clinical (PC)

Associate Professors Campagna, Head, Tanja, and Thomasson

Assistant Professors Beck and Janer

Adjunct Professor Boshell

Adjunct Associate Professors Garrett, Haynes, Herrick, Himmelwright, Jenkins, Lazarus, and Lazenby

Adjunct Assistant Professors Alexander, Burney, Carden, Dempsey, Druhan, Fisher, Godsfil, Herring, Holman, Hurd, Keith, Kent, Lantoin, Lyman, Meadows, Montgomery, Payne, Pino, Reber, Reddy, Russell, M. Short, Strother, Tibbets, Webb, R. Wilson, and Woosley

Adjunct Instructors Abbott, Anderson, Barr, Batt, Brown, Easter, Epp, Harbuck, Henderson, Ingersoll, Jones, B. Main, J. Main, Mitchell, Moulton, Nelson, Parker, Pittman, Sanchez, Scarborough, B. Short, Tillery, M. Turner, P. Turner, Walls, Williams, C. Wilson, and Woodward

- 346. CLINICAL EVALUATION OF DRUG THERAPY (3).** LEC. 3. Pr., CH 302, ZY 561, coreq., PC 347. Examination of the use and interpretation of clinical laboratory test procedures as applied to monitoring therapy.
- 347. HUMAN PATHOLOGY (5).** LEC. 5. Pr., ZY 561, CH 302, coreq., PC 346. The general mechanisms and language of disease. Special emphasis on pathogenesis of disease to include an understanding of the dynamic nature of disease.
- 348. PHARMACEUTICAL TERMINOLOGY (2).** LEC. 2. Pr., first professional year standing. Common terms and abbreviations used in the professional and scientific aspects of pharmacy and medicine.
- 447. THERAPY OF DISEASE I (3).** LEC. 3. Pr., PY 420, 531, coreq., PY 421, 532. The combination of pathophysiology, clinical chemistry, pharmacology, biopharmaceutics, etc., for specific diseases. To be presented through use of actual case studies with emphasis on the role of the pharmacist in treatment of patient.
- 448. THERAPY OF DISEASE II (3).** LEC. 3. Pr., PC 447, coreq., PY 422, 533. Continuation of PC 447.
- 449. DRUG THERAPY IN CLINICAL PRACTICE (5).** LEC. 3, CLINICAL CONFERENCE 1, LAB. 6. Pr., PC 448, PY 533. A clinical clerkship involving the observation of drug effects in patients. Students monitor and evaluate drug action by participating in patient rounds and clinical conferences.
- 450. AUTOTHERAPY (3).** LEC. 3. Pr., PC 448, PY 422, 533. Introduction to the triage function of the pharmacist. Evaluation of and response to patient illness complaints.
- 451. ADVERSE DRUG REACTIONS (3).** LEC. 3. Pr., PC 448, PY 533, and acceptance into the Doctor of Pharmacy degree program. Adverse drug reactions will be characterized in relation to organ systems. Attention will be focused on the incidence, recognition, mechanisms, and management of unwanted effects of drugs.
- 452. DRUG INFORMATION ORIENTATION (2).** LEC. 2. Pr., PC 346, 347. Evaluation, assimilation, and dissemination of drug information.
- 453. PROFESSIONAL PRACTICE (3).** LEC. 1, LAB. 6. Pr., 3rd prof. year standing. COI. Placement of students in various pharmacy practice environments to increase knowledge of practice options.
- 454. ANALYSIS OF DRUG THERAPY (3).** LEC. 3. Pr., PC 448, PY 533, and acceptance into Doctor of Pharmacy degree program. Critical analysis of the drug therapy of selected chronic and acute diseases presented in a recitation and discussion format. Integrating aspects of pathophysiology, biochemistry, pharmacology, and pharmaceutics. The student shall utilize the concept of therapeutic end points in planning and critically evaluating drug therapy.
- 455. CURRENT TOPICS IN CLINICAL PHARMACY (3).** LEC. 3. Pr., PC 448, PY 533, and acceptance into Doctor of Pharmacy degree program. Current concepts in total health care as they relate to the role of the clinical pharmacist. Such issues as nutrition, physical assessment and life support systems are presented in lecture, discussion, and demonstration format.

456. **DRUG INFORMATION SERVICES (3).** LEC. 2, LAB. 3. Pr., PC 448, PY 533, and acceptance into Doctor of Pharmacy degree program. Effective utilization and evaluation of reference, primary and secondary literature to provide a basis for the drug information skills required of patient-oriented pharmacists. Each student is required to spend a rotation in the Drug and Poison Information Center.
457. **DRUG INTERACTIONS (3).** LEC. 3. Pr., PC 448, PY 422, 533. Mechanisms of drug interactions with other drugs, foods, endogenous materials and modifications of laboratory tests due to drugs.
458. **CLINICAL SEMINAR (1).** LEC. 1. Pr., PC 448, PY 533, and acceptance into Doctor of Pharmacy degree program. Student presentation of topics in drug therapy drawn from the literature, practice experience, and research.
459. **PRACTICE EXTERNSHIP (18).** LAB. 40. Pr., third professional year standing. A structured externship experience in various practice environments, including hospital, community, and other settings.
- 480-481-482. **PHARMACY CLERKSHIP (6-6-6).** LEC. 1, LAB. 39, 3-4 WEEKS. Pr., PC 459, coreq., PC 480-481-482. Any quarter by arrangement. Conferences and clinical rotations with training in patient assessment, rationale therapy, and drug consultations in various medical, surgical, and family medicine environments.
483. **CLERKSHIP — GENERAL INTERNAL MEDICINE (6-9).** Pr., PC 448. Any quarter by arrangement. Clinical rotation with training in patient assessment, rational therapy, and consultations as these pertain to medication use.
484. **CLERKSHIP — AMBULATORY CARE (6-18).** Pr., PC 448. Any quarter by arrangement. Clinical rotation with training in patient assessment, rational therapy, and consultations as these pertain to medication use.
485. **CLERKSHIP — PEDIATRICS (6-9).** Pr., PC 448. Any quarter by arrangement. Clinical rotation with training in patient assessment, rational therapy, and consultations as these pertain to medication use.
486. **CLERKSHIP — PSYCHIATRY (6-9).** Pr., PC 448. Any quarter by arrangement. Clinical rotation with training in patient assessment, rational therapy, and consultations as these pertain to medication use.
487. **CLERKSHIP — SURGERY (6-9).** Pr., PC 448. Any quarter by arrangement. Clinical rotation with training in patient assessment, rational therapy, and drug consultations to be chosen from general cardiovascular, urology, burn and trauma, orthopedic, and other surgical specialties.
488. **CLERKSHIP — MEDICINE SPECIALTY (6-9).** Pr., PC 448. Any quarter by arrangement. Clinical rotation with training in patient assessment, rational therapy, and drug consultations to be chosen from cardiology, pulmonary, endocrinology, oncology, rheumatology, neurology, nephrology, and other medical specialties.
489. **CLERKSHIP — CLINICAL PHARMACOKINETICS (6-9).** Pr., or coreq., PY 402. Any quarter by arrangement. Clinical rotation with training in dosing of medications in patients utilizing pharmacokinetic models.
490. **CLERKSHIP — DRUG INFORMATION (3-9).** Pr., PC 448. Any quarter by arrangement. Clinical rotation with training in drug information selection, storage, retrieval, assimilation, evaluation, and dissemination.
491. **CLERKSHIP — ELECTIVE (6-9).** Pr., PC 448. Any quarter by arrangement. Clinical rotation with training in patient assessment. Rational therapy and drug consultations to be chosen from a variety of practice environments and specialty practices.
495. **SPECIAL PROBLEMS (1-3).** Pr., COI. Individualized investigation of clinical pharmacy problems as related to the delivery of health care services.

Philosophy (PA)

Professors McKown, Head, Andelson, and Davis
Associate Professors Brown and Panheri
Assistant Professor Walters

202. **ETHICS AND SOCIETY (5).** Examines topics of contemporary moral concern from the standpoint of various ethical theories.
210. **INTRODUCTION TO PHILOSOPHICAL PROBLEMS (3).** An introduction to the methods of philosophical inquiry and an examination of selected philosophical topics.
211. **INTRODUCTION TO DEDUCTIVE LOGIC (3).** Principles of deduction; analysis of arguments; selected problems in logic.
212. **INTRODUCTION TO SCIENTIFIC REASONING (3).** Inductive techniques of hypothesis formation, and a discussion of such related problems in the theory of knowledge as perception, causation, and confirmation.
214. **INTRODUCTION TO ETHICS (3).** Surveys various schools of moral philosophy and examines types of moral theory.
216. **PHILOSOPHIES OF MAN (3).** Examines philosophical anthropology by surveying alternative theories of human nature.
218. **ETHICS AND THE HEALTH SCIENCES (5).** Topics such as contraception, abortion, and eugenics; human experimentation; truth in drugs and medicine; death and dying; and other health related issues in order to clarify relevant ethical considerations and to provide philosophical bases for decisions on right and wrong, good and bad, rights and responsibilities.
305. **AESTHETICS (5).** Examines theories of beauty and art from Plato to contemporary thinkers.
330. **PHILOSOPHY OF RELIGION (5).** Examines the nature of religion, religious language, religious knowledge, religious theories of man and evil, and examines arguments for the existence of God and the immortality of the soul.

333. **HISTORY OF PHILOSOPHY I. ANCIENT AND EARLY MEDIEVAL (5).** Surveys of philosophic thought from the Pre-Socratics through Aquinas, emphasizing Plato and Aristotle.
334. **HISTORY OF PHILOSOPHY II. LATE MEDIEVAL AND EARLY MODERN PHILOSOPHY (5).** Surveys philosophic thought from Occam to Kant emphasizing major thinkers.
335. **HISTORY OF PHILOSOPHY III. RECENT AND CONTEMPORARY PHILOSOPHY (5).** Surveys various representatives of the major philosophical trends during these periods.
370. **SYMBOLIC LOGIC (5).** From the propositional calculus through the logic of relations; selected logical problems.
380. **PRAGMATISM (5).** Emphasis on Peirce, James, and Dewey. Some philosophical issues examined from a pragmatic viewpoint.
401. **PHILOSOPHICAL FOUNDATIONS OF COMMUNISM (5).** Pr., junior standing. Examines the thought of Marx-Engels and its development in Kautsky, Bernstein, Lenin.
402. **EXISTENTIALISM (5).** Pr., junior standing. Selected works of such authors as Kierkegaard, Nietzsche, Sartre, Jaspers, and Heidegger.
425. **PHILOSOPHY OF MIND (5).** Pr., junior standing. Examines classical and modern texts on the phenomenology of consciousness and mind-body problems.
432. **PROCESS PHILOSOPHY (5).** Pr., junior standing. An examination of selected writings of Bergson, James, and Whitehead.
440. **CONTEMPORARY MARXISM (5).** Pr., junior standing. Examines the thought of Lukacs, Stalin, Merleau-Ponty, Sartre, Habermas, Marcuse, and others.
455. **METAPHYSICS (5).** Pr., junior standing. A critical analysis of such topics as monism and pluralism, freedom and determinism, realism and nominalism, and the mind-body problem.
460. **EPISTEMOLOGY (5).** Pr., junior standing. The origin, nature, kinds, and validity of knowledge, with a consideration of faith, intuition, belief, opinion, certainty, and probability.
470. **PLATO (5).** Pr., junior standing. Examines such topics as Plato's Methodology, epistemology, metaphysics, ethics, political theory.
475. **ARISTOTLE (5).** Pr., junior standing. Examines Aristotle's logic, epistemology, metaphysics, ethics, political theory, psychology.
482. **BRITISH EMPIRICISM (5).** Pr., junior standing. Examines seventeenth and eighteenth-century empiricism emphasizing Locke, Berkeley, Hume.
484. **CONTINENTAL RATIONALISM (5).** Pr., junior standing. Examines major themes in such thinkers as Descartes, Spinoza, Leibniz, Gassendi.
498. **READINGS IN PHILOSOPHY (1-10).** Pr., junior standing, a 3.25 average in relevant prior work either in philosophy or in related areas and consent of department head and instructor. Specific reading programs may be developed which pertain to a particular philosopher, period or problem. A paper and an examination will be expected. May be repeated for credit.

ADVANCED UNDERGRADUATE AND GRADUATE

504. **MODERN ETHICAL THEORIES (5).** Recent analyses of the meanings, presuppositions, and problems of ethical terms and judgments.
513. **PHENOMENOLOGY (5).** The phenomenological method and its application in the works of William James, Husserl, Heidegger, Sartre, and Merleau-Ponty.
515. **PHILOSOPHY OF SCIENCE (5).** Such topics as empirical meaning, verifiability, measurement, probability, causality, and determinism.
580. **ANALYTIC PHILOSOPHY (5).** Philosophical analysis in the twentieth century from G. E. Moore through the Oxford analysts.
590. **KANT AND TRANSCENDENTAL IDEALISM (5).** The philosophy of Kant in particular but also of the early Fichte and Schelling and of neo-Kantians.
591. **HEGEL AND ABSOLUTE IDEALISM (5).** The philosophy of Hegel in particular but also of the late Fichte and Schelling, of neo-Hegelians, and of Schopenhauer and other critics.
592. **PHILOSOPHY OF LAW (5).** The nature and function of law, including such topics as judicial reasoning, the ground of authority, natural law, legal responsibility, punishment, civil disobedience, and the relation of law to ethics and the behavioral sciences.

GRADUATE

650. **SEMINAR (1-10).** Pr., COI. The content will change for each quarter in any one calendar year. This will vary from movements of thought to an intensive study of one of the great thinkers such as Plato or Whitehead. May be repeated for credit.

Physical Science (PHS)

Associate Professors Ward and Simon

- 100-101. INTRODUCTORY PHYSICAL SCIENCE (5-5). LEC. 4, LAB. 2.** An introduction to physics, chemistry, astronomy, and earth sciences for students in liberal arts, education, business, and non-science pre-professional curricula. The approach is primarily historical and cultural rather than quantitative, although adequate preparation is provided for those who will teach elementary school science.

ADVANCED UNDERGRADUATE AND GRADUATE

- 530. MODERN CONCEPTS IN PHYSICAL SCIENCE I (5). LEC. 4, LAB. 3.** Pr., PHS 101 or PS 206, or COI, junior standing.* General physical science based on IPS materials designed to acquaint the student with the IPS approach.
- 531. MODERN CONCEPTS IN PHYSICAL SCIENCE II (5). LEC. 4, LAB. 3.** Pr., PHS 101 or PS 206, or COI, junior standing.* A survey of physics topics using PSSC and Project Physics materials designed to acquaint the students with these approaches to high school physics.
- 532. NUCLEAR SCIENCE FOR TEACHERS (5). LEC. 4, LAB. 3.** Pr., a course in general physics and preferably one in chemistry plus junior standing, junior or senior high school teacher, or approval of instructor.* A course in the fundamentals of atomic and nuclear structure, designed for junior and senior high school teachers, including the study of radioactivity and nuclear radiation, radiation detection, radiological safety, nuclear fission and fusion, nuclear power reactors and power generation, advantages and hazards of nuclear power reactors.

Physics (PS)

Professors Kribel, Head, Alford, Budenstein, Fromhold, Glasser, Latimer, and Swanson
Associate Professors Chen, Clothiaux, French, Hinata, Fukai, Kinzer, Simon, Thaxton, and Ward

Assistant Professors Cooper, Pindzola, Wershinger, and Williams

- 200. FOUNDATIONS OF PHYSICS (5).** The principles of mechanics, heat, light, sound, electricity, magnetism and selected topics. For non-science majors. Credit in PS 205 or 220 precludes credit for this course.
- 205-206. INTRODUCTORY PHYSICS I-II (5-5). LEC. 4, LAB. 3.** Pr., for PS 205, MH 160; for PS 206, PS 205. A two-quarter sequence covering topics in mechanics, fluids, heat, wave motion, sound, light, electricity, and magnetism. Quantitative as well as qualitative aspects of the subject are stressed utilizing algebra and trigonometry. Primarily for students in health and agricultural sciences, architecture, and other curricula not requiring technical physics.
- 210. PRINCIPLES OF MODERN PHYSICS (5). LEC. 4, LAB. 3.** Pr., PS 206. The fundamental principles of physics to current topics. Lecture discussions are extended and supplemented by laboratory experience. Subjects include relativity, atomic and nuclear phenomena, and radiation. Credit in PS 320 or 305 precludes credit in this course.
- 215. ASTRONOMY (5). LEC. 4, LAB. 3.** Open to non-science majors. The planet Earth and the solar system; the stars; theories of stellar evolution, galaxies and the expanding universe; modern cosmological theories. The laboratory emphasizes studies with the telescope.
- 220-221-222. GENERAL PHYSICS I-II-III (4-4-4). LEC. 3, LAB. 3.** Pr., for PS 220, MH 163 or concurrently, for PS 221, MH 264 or concurrently and PS 220; for PS 222, PS 221. A three-quarter sequence using calculus wherein topics in mechanics, fluids, wave motion, sound, thermodynamics, optics, electricity, and magnetism are covered in depth. The sequence serves as a foundation for students in science and engineering curricula. PS 220-221-222 credit for entire sequence will preclude credit for PS 205-206 course.
- 300-301. ELECTRICITY AND MAGNETISM (4-4).** Pr., for PS 300, PS 222, MH 269; for PS 301, PS 300, MH 501. Electrostatics, study of fields in dielectrics, magnetic forces and their effects, electric and magnetic properties of matter, Maxwell's equations, electromagnetic waves and radiation.
- 302. ELECTRONICS (5). LEC. 4, LAB. 3.** Pr., PS 222, MH 269. Review of AC and DC circuits; theory of vacuum tubes and semiconductors; diodes as rectifiers and regulators; tube and transistor voltage and power amplifiers; feedback amplifiers and oscillators; pulse and digital circuits. Appropriate laboratory exercises form a part of the course.
- 303. OPTICS (4).** Pr., PS 301, MH 501, junior standing. Intermediate course in physical optics comprising wave motion, reflection, refraction, dispersion, origin of spectra, interference, diffraction, and polarization, with appropriate laboratory experiments.
- 305. INTRODUCTION TO MODERN PHYSICS (4).** Pr., PS 222 or 206, MH 265 or 269. Introduction to relativistic kinematics and dynamics, particle aspects of electromagnetic interaction, wave aspects of material particles, structure of the hydrogen atom, many electron atoms, nuclear structure and reactions, and molecular and solid-state physics. Credit in PS 210 or 320 precludes credit in this course.
- 306. PHYSICS LABORATORY (2). LAB. 6.** Pr., PS 300, 305. Selected laboratory experiments from fields of electricity, magnetism, and modern physics.

*Not available to graduate students in the areas of science or mathematics.

320. **MODERN PHYSICS FOR ENGINEERS (3).** LEC. 3. Pr., PS 222, MH 264. Introduction to modern physics, including special relativity, Schrodinger wave mechanics, atomic and nuclear systems, elementary particles. Credit in PS 210 or 305 precludes credit in this course.
412. **SEMINAR IN MODERN PHYSICS (1).** Pr., senior standing. Library search, written reports, and oral presentation of a pertinent topic in modern physics.
490. **SPECIAL TOPICS (1-5).** Pr., COI. Topics will vary as needed. They will include but will not be limited to such areas as: non-linear systems, gravitation, theory of waves, group theory, atomic and molecular processes, elasticity, fluid mechanics, and low temperature. May be taken for credit more than once.
491. **UNDERGRADUATE RESEARCH (3-5).** LAB. 9-15. Pr., COI and senior standing. Each student will work under the direction of a staff member on a problem of mutual interest. May be repeated for a maximum of 15 credit hours.

ADVANCED UNDERGRADUATE AND GRADUATE

501. **MECHANICS I (5).** Pr., MH 265. Newtonian mechanics, linear oscillations, non-linear oscillation introduction to calculus of variations.
502. **MECHANICS II (5).** Pr., PS 501. Hamilton's principle and Lagrange's equations, central force motion, collisions, non-inertial frames, rigid body dynamics, vibrating systems.
504. **STATISTICAL THERMODYNAMICS (5).** Pr., PS 516 or concurrently, senior standing. Temperature, entropy, and chemical potential are developed from the principles of equilibrium quantum states. The Gibbs representation is introduced and applied to the development of equilibrium distribution functions. Quantum statistics is developed and applied to problems.
- 506-507. **EXPERIMENTAL PHYSICS I-II (2-2).** LAB. 6-6. Pr., PS 301, 302. Coreq. PS 303. Selected experiments from the areas of modern physics, optics, nuclear physics, plasmas, and solid state physics.
509. **INTRODUCTION TO REACTOR PHYSICS I (5).** LEC. 4, LAB. 3. Pr., PS 305 or 320, and MH 265. Brief account of nuclear physics; basic instrumentation; interaction of neutrons with matter; chain reactions; neutron diffusion; the bare homogeneous thermal reactor; lattice constants; reactor kinetics.
510. **INTRODUCTION TO REACTOR PHYSICS II (5).** LEC. 4, LAB. 3. Pr., PS 509. Homogeneous reactor with reflector; reactor control; power reactors; thermal aspects of reactor systems; design variables; radiation detection and measurement; shielding; radiation hazards.
513. **INTRODUCTION TO X-RAY CRYSTALLOGRAPHY (5).** LEC. 4, LAB. 3. Pr., PS 305, COI. Principles of crystallography, the reciprocal lattice, theory of x-ray diffraction, and the powder, laue, and diffractometer methods.
514. **ELECTRON MICROSCOPY (5).** LEC. 3, LAB. 6. Pr., PS 222 and MH 264. Electron optics; theory and operation of the electron microscope; techniques of mounting, replication and shadowing of specimen; electron diffraction, theory and interpretation of patterns.
- 515-516. **INTERMEDIATE MODERN PHYSICS I-II (5-5).** Pr., MH 269, PS 305 or 320. Special theory of relativity; introductory quantum mechanics with applications to microscopic systems; Fermi-Dirac, Bose-Einstein statistics; and electronic bands in solids.
517. **INTRODUCTION TO BIOPHYSICS (5).** Pr., COI. The physics of biological systems, with emphasis on the cellular and subcellular levels; effects of light and high energy radiations, bio-electric phenomena, bio-energetics, etc.
519. **SCIENTIFIC INSTRUMENTATION (3).** LEC. 2, LAB. 3. Pr., PS 206, MH 162. COI. For advanced undergraduates and graduate students in the natural sciences. The course is directed to the selection and use of equipment normally used for lab experimentation in the scientific fields. Pertinent laboratory experiments will accompany the course.
520. **NUCLEAR PHYSICS AND ELEMENTARY PARTICLES (5).** Pr., PS 516. Radioactivity; nuclear radiation; nuclear forces; structure of nucleus, nuclear reactions, accelerators and reactors. A treatment of elementary particles including conservation laws, symmetry principles, decay modes and classification.
521. **MODERN ELECTRONICS (5).** LEC. 3, LAB. 6. Pr., PS 302. Network theory and digital logic; state-of-the-art electronic devices; operational amplifiers; linear and digital integrated circuits; servo systems; selected topics in modern instrumentation.
525. **PRINCIPLES OF NUCLEAR ENERGY SYSTEMS (5).** Pr., PS 305 or 320 and MH 265 or COI. Fundamental aspects of nuclear energy systems including: nuclear properties of matter, the fission process, radiation, nuclear reactor and plant design, thermal aspects of nuclear reactors, reactor control, safety analysis, licensing, isotope power sources, space applications, and fusion.
- 531-532-533. **METHODS OF THEORETICAL PHYSICS I-II-III (3-3-3).** Pr., MH 362. Theoretical methods used in classical and quantum physics, including applications of transformations, special functions, Green's functions, variation and perturbation theory, tensor and group theory.
535. **INTRODUCTION TO SOLID STATE PHYSICS (5).** Pr., PS 516, MH 264 or COI. Solid state phenomena including lattice vibrations, band description of electronic states in metals, semiconductors and insulators, and magnetic phenomena.
545. **PLASMA PHYSICS (4).** Pr., PS 301. COI or senior standing. Collision phenomena in gases, creation of ionized gases (plasmas), interaction of plasmas and fields, plasma heating, instabilities, radiation and applications.
560. **GENERAL THEORY OF RELATIVITY (4).** Pr., MH 269. PS 305 or 320, COI or junior standing. Tensor analysis by computer using the analytical language FORMAC. General theory of relativity with applications.

570. **HEALTH PHYSICS (5), LEC. 4, LAB. 3.** Pr., COI. Fundamental principles of radioactivity; instrumentation for detecting and monitoring radioactive nuclides; radiation effects on man; permissible radiation dosages; safe handling of radioactive substances; and shielding from various radiations.

GRADUATE

601. **ADVANCED DYNAMICS I (3).** Pr., PS 502. D'Alembert's principle; introduction to the calculus of variations; Hamilton's principle and Hamilton's equations; principle of least action.
602. **ADVANCED DYNAMICS II (3).** Pr., PS 601. Canonical variables and contact transformations, the Hamilton-Jacobi equation; action; angle variables; Poisson brackets; continuous systems.
603. **MECHANICS OF CONTINUOUS MEDIA (3).** Pr., PS 602. Introduction to theories of elasticity and fluids.
- 604-605-606. **THEORY OF ELECTRICITY AND MAGNETISM I-II-III (3-3-3).** Pr., PS 503 or EE 391; coreq., MH 607-608-609. Maxwell's formulation of classical electromagnetic theory. Includes electrostatics, magnetostatics, potential problems; electric currents, Maxwell's equations, electromagnetic waves, radiation theory, boundary value problems.
607. **PHYSICAL OPTICS (3).** Pr., PS 606 or COI. Current topics in optics, such as Fourier optics, diffraction theory, light scattering, laser physics, optical echoes, holography, and propagation in optical waveguides.
611. **PLASMA PHYSICS I (3).** Pr., PS 301, 502 or COI. Particle interactions and orbit theory, plasma kinetic theory, Boltzmann equation, transport phenomena, Fokker-Planck equation, plasma generation and diagnostics.
612. **PLASMA PHYSICS II (3).** Pr., PS 611 or COI. Wave phenomena in plasmas, free and forced plasma oscillations, waves in anisotropic plasmas, shock waves, plasma stability, beam-plasma interactions.
613. **PLASMA PHYSICS III (3).** Pr., PS 612 or COI. Radiation processes in plasmas without magnetic fields, bremsstrahlung of transverse waves, cyclotron radiation and echoes, scattering of transverse waves.
614. **PLASMA SPECTROSCOPY (3).** Pr., PS 606, 642, or COI. Classical and quantum radiation theory, line oscillator strengths, line-broadening, equilibrium relations, temperature and density measurements.
628. **STATISTICAL MECHANICS I (3).** Pr., PS 502, 504. Theory and applications of equilibrium statistical mechanics; relation of statistical mechanics to thermodynamics.
629. **STATISTICAL MECHANICS II (3).** Pr., PS 628. Statistical mechanics of quantum mechanical systems. Introduction to non-equilibrium statistical mechanics. Boltzmann transport equation. Fluctuations and dissipation.
630. **MODERN PHYSICS FOR HIGH SCHOOL TEACHERS (5), LEC. 4, LAB. 3.** Pr., MH 587 or equivalent. Physics since 1890 including: structure of matter; atomic and molecular spectra; X-rays, natural and induced radioactivity; nuclear fission and fusion; and cosmic rays.
632. **SPECIAL THEORY OF RELATIVITY (3).** Pr., PS 602, 604. Relativistic mechanics, covariant formulation of Maxwell's field equations, Lagrangian and Hamiltonian formulation of fields.
635. **SOLID STATE PHYSICS I (3).** Pr., PS 535, 643. Electrons in a perfect crystal lattice, description of the symmetry properties of solids, Brillouin zones.
636. **SOLID STATE PHYSICS II (3).** Pr., PS 635. Cohesive energy, interaction of electrons with electromagnetic radiation, interactions between electrons and the crystal lattice.
637. **SOLID STATE PHYSICS III (3).** Pr., PS 636. Magnetic properties of solids; para-, dia-, ferro-, and antiferromagnetic effects. Resonance experiments, optical properties of solids.
639. **DIRECTED READING IN PHYSICS (2).** Pr., COI. May be repeated for credit.
- 641-642-643. **QUANTUM MECHANICS I-II-III (3-3-3).** Pr., for PS 641, 502; for 642, 641, and for 643, 642. Duality of particles and waves; uncertainty principle; wave functions and Schrodinger's equation; one-dimensional states; operator and matrix formalism; bound states problems; angular momentum; stationary and time-dependent perturbation theory; spin and identical problems; scattering theory; atoms, molecules and solids; interaction of radiation with matter.
- 644-645. **ADVANCED QUANTUM MECHANICS I-II (3-3).** Pr., PS 643 or COI. Dirac electron; field quantization; interactions; Feynmann diagrams; dispersion relations.
650. **BIOLOGICAL EFFECTS OF RADIATION (5), LEC. 3, LAB. 6.** Pr., ZY 310 or ZY 525 or equivalent, PS 205 and 206 or equivalent, or COI. (Same as ZY 650.) Summer. An introduction to radiation biology including radiation physics; radiation detection equipment; dosimetry; the effects of ionizing radiation at molecular, cellular, organ, and organismic levels, and radioprotection. Credit in ZY 650 precludes credit in PS 650.
653. **SEMINAR IN PHYSICS (2).** Pr., COI. May be repeated for credit.
655. **SPECIAL TOPICS IN THEORETICAL PHYSICS (3).** Pr., COI. Choice of topic will vary but will include: relativity theory; group theory; atomic and molecular structure; elasticity; fluid mechanics; quantum field theory; low temperature physics. May be repeated for credit.
661. **NUCLEAR STRUCTURE (3).** Pr., PS 505, PS 643. Selected topics on properties of nuclei.
662. **NUCLEAR PROCESSES (3).** Pr., PS 661. Radioactive decay, nuclear reactions.

- 671-672. **ADVANCED SOLID STATE THEORY I-II (3-3).** Pr., PS 637. Quantum field theory methods of solving the many-body problem, second quantization, statistical mechanics in occupation number formalism, Feynmann diagrams and infinite-order perturbation theory. Green's function propagators, "dressed" interactions and quasi-particles, many-body effects in metals, Fermi liquid theory, present-day theories of super-conductivity, ferromagnetism, and other cooperative phenomena.
691. **DIRECTED READING IN CONTEMPORARY PHYSICS. (CREDIT TO BE ARRANGED.)** Pr., completion of 30 hours of advanced courses in physics. May be repeated for credit.
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)**
799. **RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)**

Political Science (PO)

Professors Dickson, Hayhurst, Hobbs, and Walkin
Associate Professors Johnson, Head, Martin, Montjoy, Heilman,
Nelson, O'Toole, and Ward
Assistant Professors Burns, Kelly, Latimer,
Pickering, Pendergast, Smith, Widell, and Woodard
Instructor Cannon

209. **INTRODUCTION TO AMERICAN GOVERNMENT (5).** Constitutional principles; federalism; elections and public opinion; legislative, executive, and judicial departments; principal functions.
210. **AMERICAN STATE AND LOCAL GOVERNMENT (5).** State constitutional principles; organization and functions of state government; national-state and state-local relations; special attention to Alabama government.
260. **SURVEY OF LAW ENFORCEMENT (5).** Pr., sophomore standing. (Same as LE 260.) Introduction to the philosophical and historical backgrounds; agencies and processes; purposes and functions; administration and technical problems; career orientation.
300. **POLITICAL SCIENCE RESEARCH METHODS (5).** Pr., PO 209 or 210 and sophomore standing. Introduction to empirical research methods in political science with attention to computer applications.
301. **POLITICAL SCIENCE STATISTICS (5).** Pr., sophomore standing. Introduction to elementary statistical procedures applied to political science subject matter.
309. **INTRODUCTION TO INTERNATIONAL RELATIONS (5).** Pr., sophomore standing. International relations, including a consideration of the bases of national power and the rudiments of international politics.
311. **INTERNATIONAL ORGANIZATION (5).** Pr., sophomore standing. The evolution of international organization from the beginning through the United Nations.
312. **INTRODUCTION TO COMPARATIVE GOVERNMENT AND POLITICS (5).** Pr., sophomore standing. Methods of classifying governments by institutional and developmental characteristics. A review of the forces which create political stability and instability, democracy and dictatorship; contemporary political systems in selected countries will be used for comparison.
314. **AMERICAN FOREIGN POLICY (5).** Pr., sophomore standing. Analysis of the decision-making process of American foreign policy and of selected current issues of American foreign policy.
315. **AMERICAN POLITICAL THOUGHT (5).** Pr., sophomore standing. The principal American political philosophers and philosophies and their influence on political institutions.
316. **NATIONAL SECURITY AND FOREIGN POLICY (3).** Pr., sophomore standing. Introduction to national security aspects of United States foreign policy.
317. **NATIONAL SECURITY AND DOMESTIC POLICY (3).** Pr., sophomore standing. Introduction to U.S. national security in its domestic policy implications.
318. **LATIN AMERICA AND THE UNITED STATES (3).** An analysis of Latin American-United States relations in their political, social and economic aspects.
320. **INTERGOVERNMENTAL RELATIONS (3).** Pr., PO 209 or 210 and sophomore standing. Relationships between units of local, state and national governments in structural and policy areas; federalism in theory and practice.
323. **MUNICIPAL GOVERNMENT IN THE UNITED STATES (5).** Pr., PO 210 and sophomore standing. Functions of city government, relation of city to state; electorate, party system and popular control; forms of government; administrative organizations; some reference to Alabama.
324. **AMERICAN COUNTY GOVERNMENT (5).** Pr., PO 210 and sophomore standing. The changing role of county government in the American Federal system. Covers county government history, organization, services, finances, and political party and interest group politics.
325. **INTRODUCTION TO PUBLIC ADMINISTRATION (5).** Pr., sophomore standing. Organization, development, procedures, process, and human factors involved in administration in a political environment.
326. **THEORY OF PUBLIC ORGANIZATION (3).** Pr., sophomore standing. The structure and functioning of governmental organizations with an emphasis on theories of administrative hierarchies and evaluation of bureaucracy.

327. **POLICY AND ADMINISTRATION (5).** Pr., sophomore standing. Formulation, decision making and implementation of public policy in its administrative context.
328. **GOVERNMENT AND THE ECONOMY (3).** Pr., sophomore standing. An examination of constitutional and political bases of governmental action; the origin and evolution of policies; relationships between political and economic institutions; and the consequences of governmental action or inaction.
329. **THE AMERICAN PRESIDENCY (5).** Pr., PO 209, sophomore standing. The President as legislative leader, chief executive, chief diplomat, and commander-in-chief. Political styles and personalities of recent presidents. Presidential decision-making.
330. **INTRODUCTION TO NATIONAL LAW (3).** Pr., sophomore standing. Development of Western state legal systems, rule making, functions of law in society, legal interpretation.
331. **THE LEGISLATIVE PROCESS (3).** Pr., PO 209 or 210, sophomore standing. The principles, procedures, and problems of lawmaking in the United States; special attention to Congress and the state legislatures.
332. **THE JUDICIAL PROCESS (3).** Pr., sophomore standing. The role of the courts; the nature of jurisprudence; comparative legal systems; the origin of law; and the concept of legality.
333. **ADMINISTRATIVE RESPONSIBILITY (3).** Pr., sophomore standing. Roles and functions of public administration in a democratic society. Emphasis on bureaucratic ethics.
336. **CRIMINAL JUSTICE (3).** Pr., sophomore standing. An in-depth examination of the various procedural due process rights of the Constitution as they relate to the criminal processes—historical development, modern interpretations, and further trends.
340. **POLITICAL PARTIES AND POLITICS (5).** Pr., PO 209, sophomore standing. The nature, organization, and operation of political parties in the United States; the suffrage; nominating and electoral processes; importance and nature of interest groups.
341. **PRESSURE GROUPS (3).** Pr., sophomore standing. Major private associational groups affecting public policy in the United States. Special attention to their structures, funding, public regulation, and political activities.
342. **POLITICS AND THE MEDIA (5).** Influences of the media (broadcast and printed) on political action, the electoral process and popular concepts of political institutions; "use" of the media and its regulation by government.
355. **REPORTING OF POLITICAL AFFAIRS (3).** Pr., PO 210. (Same as JM 355.) Instruction and news assignments in political affairs with emphasis on state government. Credit in JM 355 precludes credit in PO 355.
360. **INTRODUCTION TO HEALTH SERVICES ADMINISTRATION (5).** Introduction to basic concepts and principles of administration of health services organizations.
410. **ADMINISTRATION AND MANAGEMENT OF RECORDS (3).** Pr., sophomore standing. The principles and use of records management in the systematic analysis and scientific control of the life cycle of governmental, business and university records in terms of quantity, quality, and cost.
420. **HEALTH SERVICES POLICY (5).** Political issues affecting health care services.
450. **INTERNSHIP (5-10).** Pr., PO, PUB or HA major and junior standing. (S-U grading only.) Practical political or administrative experience in public agencies or related activities arranged and approved by the department.
451. **INTERNSHIP READING COURSE (5).** Coreq., concurrent enrollment in either PO 450 or LE 464. COI. Content of reading by agreement of student and instructor. Not open to graduate students.

ADVANCED UNDERGRADUATE AND GRADUATE

501. **AMERICAN CONSTITUTIONAL LAW I (5).** The Constitution of the United States on the basis of the decisions and opinions of the Supreme Court defining judicial review, the relationship of the executive, legislative, and judicial branches of the national government, and the federal system.
502. **AMERICAN CONSTITUTIONAL LAW II (5).** The Constitution of the United States on the basis of the leading decisions and opinions of the Supreme Court defining civil rights in relation to both national and state governments.
505. **METROPOLITAN AREA GOVERNMENTAL PROBLEMS (3).** Political, governmental, and administrative organization and actions in urban areas with many governmental entities; governmental problems resulting from urbanization and possible solutions.
514. **FINANCIAL ADMINISTRATION (3).** Theory and practice of budgeting. Emphasis on the politics of financial administration and accountability.
515. **PUBLIC PERSONNEL ADMINISTRATION (3).** Personnel policies and processes of national, state and local governments. The role of politics in public personnel management.
516. **PROBLEMS AND POLICIES IN HEALTH ADMINISTRATION (3).** Pr., PO 325. Issues in administration of health services. Implications for health administrators of current policy developments.
517. **LABOR RELATIONS IN PUBLIC ORGANIZATIONS (3).** Pr., PO 515 or equivalent. (Same as MN 517.) The background, legal and constitutional aspects and administration of group negotiations and collective bargaining in public employment. Credit for this course precludes credit for MN 517.
518. **ADMINISTRATIVE LAW (3).** General nature of administrative law; types of administrative action and enforcement; analysis of rule-making and adjudication; administrative due process; judicial review. Case method.

519. **PROBLEMS IN PUBLIC ADMINISTRATION (5).** Pr., COI, senior or graduate standing. Review of selected problems in public administration through readings, case studies and individual research projects.
520. **POLITICAL THOUGHT BEFORE THE NINETEENTH CENTURY (5).** The development of political thought from the Greeks to 1800; attention to the philosophers and the early theories that are found in modern political institutions.
521. **POLITICAL BEHAVIOR (5).** Pr., PO 300 or COI. An analysis of the processes of political attitude formation. Special emphasis on the development and testing of empirical theories of political culture, political socialization process, public opinion formation and participation.
522. **RECENT AND CONTEMPORARY POLITICAL THEORY (5).** The political theories of the nineteenth and twentieth centuries; analysis and comparison of modern ideologies.
523. **COMMUNIST THEORY AND PRACTICE (3).** Marxist ideology as modified by Lenin, with illustrations of actual practice drawn from all sides of the communist world.
526. **GOVERNMENTS OF WESTERN EUROPE (5).** Descriptions and analyses of the principal political structures and power systems of Western Europe with particular emphasis upon Great Britain, France, and Germany.
528. **GOVERNMENT AND POLITICS OF THE NEAR EAST (5).** The political environment, institutions, and processes of the Near East countries, radicalism and conservatism in the area, the Arab-Israeli conflict, and major power interests.
533. **GOVERNMENT AND POLITICS OF THE FAR EAST (5).** The political environment, institutions, and processes of the Far East, with emphasis on China and Japan; also foreign relations of the area including Great Power interests.
534. **GOVERNMENT AND POLITICS OF AFRICA (5).** The political environment, institutions, and processes of sub-Saharan Africa. The colonial heritage, problems of tribalism, stability, and political and economic development, with special attention to selected countries and current events and issues.
535. **CONTEMPORARY INTERNATIONAL POLITICS (5).** A survey of the conflicts of national interests in contemporary international politics with special emphasis on the efforts to resolve these issues through diplomacy. This course will give students the opportunity to apply their academic training to an analysis of actual contemporary international issues.
536. **GOVERNMENT AND POLITICS OF THE SOVIET UNION (5).** The present status of the Soviet totalitarian system with attention to its origin, the essentials of the Stalinist pattern, the post-Stalinist political dynamics, and the nature and significance of contemporary changes.
537. **SOVIET FOREIGN POLICY (5).** The factors affecting Soviet foreign policy as seen in historical perspective, with emphasis on the post-war Stalinist practices and the modifications made by the post-Stalin leadership.
538. **GOVERNMENT AND POLITICS OF EASTERN EUROPE (5).** A comparative study of the political institutions of the Eastern European Communist states, emphasizing especially those features which diverge the most from the totalitarian pattern of the Stalinist era. Attention will also be given to the foreign relations of the Eastern European powers, including those with the Soviet Union and Communist China.
539. **GOVERNMENT AND POLITICS OF LATIN AMERICA (5).** The political environment, institutions, and processes of Latin America with emphasis on dynamic factors that influence the degree of democracy and authoritarianism, stability and instability, and politico-economic development in the area.
540. **INTERNATIONAL LAW (5).** The origin and development of international law with special emphasis on recent and current developments—trends.
542. **MAJOR GOVERNMENTS OF LATIN AMERICA (5).** Survey of governmental institutions and political processes in selected Latin American countries. Emphasis on Argentina, Brazil, and Mexico.
545. **GOVERNMENT AND POLITICS OF THE DEVELOPING NATIONS (5).** Broad analysis of political underdevelopment and developing nations, taking account of forces for modernization, problems of internal stability, system characteristics, ideologies, socio-economic development policies, roles in the international community and prospects.
550. **SPECIAL PROBLEMS IN HEALTH ADMINISTRATION (1-5).** Pr., COI. Qualified students conduct systematic investigation of selected problems in administration of health services under supervision of instructor.
551. **TOPICS IN HEALTH ADMINISTRATION (1-5).** Pr., PO 360 or COI. Analysis of specific problems in health administration. May be repeated for a maximum of 10 hours credit.
552. **PROGRAM EVALUATION FOR POLITICAL SCIENTISTS AND PUBLIC ADMINISTRATORS (5).** Pr., PO 300 and junior standing. Theory and practice of action program evaluation in the public sector with attention to program planning, process assessment, and impact assessment.
590. **SEMINAR IN POLITICAL SCIENCE METHODOLOGIES (5).** Pr., senior or graduate standing. Critical review of the literature on approaches, analytical constructs, research techniques and data compilation in national and cross-national perspectives.

GRADUATE

611. **SEMINAR IN AMERICAN GOVERNMENT (3-5).** A systematic examination of functions, problems, and issues within the political and constitutional framework of selected areas of American government.
613. **SEMINAR IN STATE AND LOCAL GOVERNMENT (3-5).** A systematic examination of functions, problems, and issues within the political and constitutional framework of selected areas of state and local government. Some attention will be given to Alabama.

- 625. SEMINAR IN POLITICAL PARTIES, PRESSURE GROUPS AND POLITICAL ISSUES IN THE UNITED STATES (5).** The interaction of political parties, pressure groups and the general public as a determinant in resolving political issues.
- 635. SEMINAR IN PUBLIC ADMINISTRATION (5).** Various processes, functions, theories, practices and systems as treated in the literature of public administration.
- 636. SEMINAR IN POLICY AND ADMINISTRATION (5).** Formation, execution, and evaluation of public policy, plus in-depth analysis of selected policy areas.
- 642. PLANNING, ADMINISTRATION AND GOVERNMENT (5).** Pr., RP 601 or COI. Policymaking as a public process; planning powers and policy formulation. Identification and selection of goals, development of programs and measuring of performance. Concepts and operations of government and public services and facilities. Credit for this course precludes credit for RP 642.
- 644. PUBLIC SERVICES AND FISCAL POLICY (3).** Pr., COI. Policy implications of public fiscal programs, budgeting, intergovernmental transfers, benefit-cost analysis and applied financial techniques.
- 645. SEMINAR IN COMPARATIVE GOVERNMENT (5).** The major institutions, functions, and problems of representative political systems. Includes the methodology and bibliography of comparative government and politics.
- 655. SEMINAR IN INTERNATIONAL RELATIONS (5).** The basic literature of the field of International Relations with special emphasis on the critical evaluation of this material.
- 665. SEMINAR IN POLITICAL THEORY (3-5).** The problems of scope and methods of inquiry in the fields of political theory with intensive research in selected topics.
- 675. SEMINAR IN CONSTITUTIONAL LAW (5).** Selected areas of constitutional law with readings in depth in relevant cases and constitutional theory.
- 699. RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)**

READING COURSES

Directed reading courses enable graduate students to pursue specialized topics. They require permission of the department head or graduate adviser, and the supervisory professor and may be repeated for credit. Normally a reading course in a subject should be taken after the seminar in that subject. Except by special permission no more than two reading courses may be taken in a master's program.

- 617. READING COURSE IN AMERICAN GOVERNMENT (3-5).**
- 627. READING COURSE IN PUBLIC LAW (3-5).**
- 637. READING COURSE IN PUBLIC ADMINISTRATION (3-5).**
- 647. READING COURSE IN COMPARATIVE GOVERNMENT (3-5).**
- 657. READING COURSE IN INTERNATIONAL RELATIONS (3-5).**
- 667. READING COURSE IN POLITICAL THEORY (3-5).**

Poultry Science (PH)

Professors Moore, *Head*, Edgar, Mora, and McDaniel

Associate Professors Brewer and Roland

Assistant Professors Brake and Giambrone

- 201. POULTRY SCIENCE (5). LEC. 4, LAB. 2.** Fall, Winter, Spring, Summer. Principles of poultry production, including breeding, feeding, housing, and diseases.
- 302. POULTRY MEAT PRODUCTION (3). LEC. 2, LAB. 2.** Fall. Practical problems involved in raising broilers and turkeys for meat production.
- 407-409. SUPERVISED AVIAN INVESTIGATIONS (3-3). LEC. 1, LAB. 4.** Junior standing and COI. All quarters. Investigation of some phase of avian science of interest to the student.
- 422. AVIAN DISEASES (5). LEC. 4, LAB. 2.** Winter. Etiology, transmission, diagnosis, prevention and treatment of infectious and parasitic diseases. (For veterinary students only.)

ADVANCED UNDERGRADUATE AND GRADUATE

- 504. POULTRY MANAGEMENT (5). LEC. 4, LAB. 2.** Pr., PH 201. Winter. Poultry problems and management of commercial flocks.
- 505. POULTRY FEEDING (3).** Pr., PH 201. Fall. Composition and use of poultry feeds in connection with the demands for growth, body maintenance, and egg production.

506. **FERTILITY AND HATCHABILITY OF AVIAN SPECIES (3).** LEC. 2, LAB. 2. Pr., PH 201 or COI, Spring. Fertility, artificial insemination, embryonic development and hatchability of avian species.
508. **CONTROL OF POULTRY DISEASES AND PARASITES (5).** LEC. 4, LAB. 2. Spring. Prevention, diagnosis, control and treatment of the common diseases and parasites of poultry.
510. **GENETICS OF THE FOWL (3).** LEC. 3. Pr., ZY 300. Spring. Physiology of reproduction and inheritance of various poultry characters responsible for efficient egg and meat production and low mortality.
511. **PROCESSING AND MARKETING (3).** LEC. 2, LAB. 2. Spring. Problems involved in processing and marketing poultry meat and eggs.
523. **BIOLOGICAL RHYTHMS (5).** LEC. 5. Pr., ZY 524 or COI, Spring. Factors that affect the rhythmic pattern of organisms. Both exogenous and endogenous rhythms will be studied.

GRADUATE

604. **ADVANCED POULTRY PRODUCTION (5).** LEC. 5. Spring. Advanced studies on various phases of poultry production.
606. **ADVANCED POULTRY BREEDING (5).** LEC. 4, LAB. 2. Fall. Advanced principles of heredity as applied to poultry breeding.
607. **SPECIAL PROBLEMS. (CREDIT TO BE ARRANGED.)** COI, all quarters. (a) nutrition. (b) physiology. (c) path-parasitology. (d) microbiology. (e) immunochemistry. (f) management. (g) transmission EM (fall only). (h) scanning EM (fall only).
608. **SEMINAR. (CREDIT TO BE ARRANGED.)** Fall, Spring, Winter, Summer.
610. **ADVANCED POULTRY NUTRITION (5).** LEC. 5. Winter. Nutrients, their function and the nutritional requirements of poultry.
611. **ADVANCED POULTRY MANAGEMENT (5).** LEC. 5. Summer. Principles of management of commercial poultry flocks.
612. **ADVANCED POULTRY DISEASES (5).** LEC. 1, LAB. 8. Pr., PH 508 or COI, Fall. Isolation, cultivation, and identification of bacterial, fungal, and viral agents. Emphasis on biochemical aspects of microbial and nutritional diseases and the mechanisms of the immune response.
613. **ADVANCED POULTRY DISEASES (5).** LEC. 1, LAB. 8. Pr., VM 518 and PH 612, or equivalent, Winter. Continuation of PH 612 with emphasis on those disease conditions caused by protozoa, helminths, and arthropods and the gross and histopathology of diseases studied in both quarters.
614. **IMMUNOCHEMISTRY (5).** LEC. 3, LAB. 4. Pr., general bacteriology, immunology and organic or biochemistry. Fall. Fundamental principles of immunology including specificity, antibody synthesis and the thermodynamics of antigen-antibody reactions. Laboratory will include the use of immunodiffusion, immunoelectrophoresis, fluorescent-antibody technique and quantitation of the precipitin reaction.
615. **AVIAN PHYSIOLOGY (5).** LEC. 2, LAB. 6. Pr., ZY 524 and organic chemistry. Winter. General physiology of birds with particular reference to domesticated species.
618. **EXPERIMENTAL VIROLOGY (5).** LEC. 3, LAB. 4. Pr., BY 542 and CH 520 or equivalent and COI, Winter. Properties of plant, animal and bacterial viruses including biochemical and biophysical properties and mechanisms of infection. Laboratory includes isolation, purification and fractionation of viruses; identification of anti-viral agents using in vitro systems.
620. **TRANSMISSION AND SCANNING ELECTRON MICROSCOPY (5).** LEC. 2, LAB. 6. Pr., COI, graduate standing. Spring. Theory and operation of the transmission and scanning electron microscopes, techniques in fixation, embedding, sectioning, and staining. Interpretation of ultrastructures.
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)** All quarters. Technical laboratory. Problems related to poultry.

Psychology (PG)

Professors Lewis, Head, Gynther, Harzem, and Schaeffer
Associate Professors Burkhart, Green, Hannay, Hess, Irvine,
Kelley, King, McCoy, Proctor, Rogers, and Vallery
Assistant Professors Benson, Cunningham, and Sauser

211. **PSYCHOLOGY (5).** An introduction to the field of behavior.
212. **DEVELOPMENTAL PSYCHOLOGY (5).** An introduction to cognitive, social and emotional development across the life span.
213. **PSYCHOLOGY OF ADJUSTMENT (5).** The dynamics of normal interpersonal relationships and personal adjustment. Does not count toward the major in psychology.
300. **INTRODUCTION TO CLINICAL AND COMMUNITY PSYCHOLOGY (3).** Pr., PG 211. Introduction to theory and methods of clinical and community psychology.
301. **PSYCHOLOGY IN THE CRIMINAL JUSTICE SYSTEM (5).** LEC. 4, LAB. 2. Pr., PG 211. Introduction to theory, research, and applications of psychological principles in the criminal justice system.

302. **PSYCHOLOGICAL ASPECTS OF DEATH AND DYING (3).** Pr., sophomore standing. A survey of psychological literature on dying, death and grief.
314. **PSYCHOLOGY AS A SCIENCE (3).** Introduction to the use of the scientific method in psychology.
315. **QUANTITATIVE METHODS (5).** LEC. 3, LAB. 4. Pr., PG 211 and MH 140 or equivalent. Introduction to the measurement of behavior and to quantitative methods of data analysis.
320. **EXPERIMENTAL PSYCHOLOGY I: LEARNING (5).** LEC. 3, LAB. 3. Pr., PG 211 and 315. Concepts, problems, and experimental techniques in learning.
321. **EXPERIMENTAL PSYCHOLOGY II: SENSORY PROCESSES (5).** LEC. 3, LAB. 3. Pr., PG 211 and 315 or departmental approval. Discrimination, generalization, and their physical and psychological correlates.
322. **EXPERIMENTAL PSYCHOLOGY III: PERSONALITY (5).** LEC. 3, LAB. 3. Pr., PG 320. Introduction to personality with emphasis placed on the nature, description, dynamics and determinants of personality.
330. **EXPERIMENTAL PSYCHOLOGY IV: SOCIAL (5).** LEC. 4, LAB 2. Pr., PG 211 or SY 201 and PG 212 and SY 204 or SW 375. Introduction to the field of social psychology. Laboratory work relating to investigation of social psychological problems, data collection and analysis, and report writing.
350. **BEHAVIOR MODIFICATION IN EARLY CHILDHOOD (5).** LEC. 3, LAB. 4. Pr., departmental approval. Application of learning principles to the modification of behavior in the preschool child. Laboratory practice will supplement classroom discussion.
412. **ADVANCED DEVELOPMENTAL PSYCHOLOGY (5).** Pr., PG 212 and 314 or COL. Advanced topics in developmental psychology selected from among cognitive, emotional and social processes in child and/or life-span development.
420. **PSYCHOLOGY OF WOMEN (5).** Pr., junior standing. Women from a psychological point of view covering stereotypes, roles, and origins of sex differences.
431. **SOCIAL PSYCHOLOGY (5).** Pr., departmental approval, junior standing. Social psychological processes and theories of social behavior.
433. **PERSONALITY (5).** Pr., 10 hours of psychology or departmental approval. Objective, phenomenological, and psychoanalytic theories of personality.
435. **ABNORMAL PSYCHOLOGY (5).** Pr., 10 hours of psychology or departmental approval. Types of abnormal behavior and their social and biological origins. Opportunities for field trips.
440. **PHYSIOLOGICAL PSYCHOLOGY (5).** Pr., PG 320 and 321 or departmental approval. The physiological correlates of behavior.
444. **PSYCHOLOGICAL ASPECTS OF SEXUAL BEHAVIOR (5).** Pr., junior standing. Human sexuality from a psychological perspective.
450. **LEARNING (5).** Pr., PG 320 or departmental approval. Theories of learning and their logical and empirical foundations.
465. **PSYCHOLOGY AND DESIGN (5).** Principles of psychology relating to the design of equipment and environments.
480. **HISTORY OF PSYCHOLOGY (5).** Pr., 20 hours of psychology or departmental approval. Evolution of psychology from physics, physiology, and philosophy to a science of behavior.

ADVANCED UNDERGRADUATE AND GRADUATE

507. **MATURITY AND AGING (5).** Pr., PG 212. Development psychology relating to changes in and problems of human maturity from early adulthood to old age.
515. **INTRODUCTION TO THEORY OF MEASUREMENT (5).** Pr., PG 315 or departmental approval. Theories of measurement and psychological testing with examples of their applications.
516. **PSYCHOLOGICAL TESTING (5).** LEC. 3, LAB. 6. Pr., PG 515 or departmental approval. Issues and applications of group assessment techniques.
530. **PERCEPTION (5).** Pr., PG 321 or departmental approval. Theories of perception, emphasizing both general and individual factors that influence meaning.
534. **PSYCHOLOGY OF EXCEPTIONAL CHILDREN (5).** Pr., PG 212. Psychological aspects of handicapped and gifted children.
536. **PSYCHOLOGY OF ABNORMAL CHILDREN AND ADOLESCENTS (5).** Pr., PG 212. Introduction to cognitive, emotional, and behavioral disturbances in children and adolescents.
545. **ANIMAL BEHAVIOR (5).** Pr., PG 320 and 321 or departmental approval. Analysis of unlearned and learned animal behavior and its evolutionary development, integrating the contributions of ethological and behavioristic research.
555. **HUMAN LEARNING AND MEMORY (5).** Pr., PG 320 or departmental approval. Survey of research methodology, empirical data, and theoretical interpretations relevant to the acquisition, retention and forgetting of verbal concepts and verbal materials.
557. **TECHNIQUES AND APPLICATIONS OF BEHAVIOR THERAPY (5).** Pr., PG 320 or 350 and departmental approval. Analysis of empirically derived therapeutic procedures and their application to socially and clinically relevant behavior.

561. **INDUSTRIAL PSYCHOLOGY (5).** The uses of psychology in business and industry.
562. **TRAINING AND SUPERVISION OF INDUSTRIAL PERSONNEL (3).** Application of the principles of learning to the training of factory, office, and sales employees.
563. **INTERVIEWING AND CLASSIFYING INDUSTRIAL PERSONNEL (3).** Principles and practices in interviewing.
590. **INDEPENDENT STUDY (1-8).** Pr., departmental approval. An individual problems course. Each student will work under the direction of a staff member on some experimental or theoretical problem of mutual interest. May be repeated for a maximum of 8 credit hours but only one registration per quarter permitted.
595. **SEMINAR IN PSYCHOLOGY (1-5).** Pr., departmental approval. Seminars on research and theory in various areas of psychology.

GRADUATE

600. **HISTORY, THEORIES, AND SYSTEMS IN PSYCHOLOGY (5).** A survey of historical developments in psychology with emphasis on the major theories and systems which have had an impact on current conceptions in psychology.
601. **ETHICS AND PROBLEMS OF PROFESSIONAL AND SCIENTIFIC PSYCHOLOGY (5).** Survey of ethical issues and current problems in professional and scientific psychology.
602. **COMMUNITY PSYCHOLOGY (5).** Historical overview of community psychology and analysis of empirical and theoretical issues in community psychology.
603. **SCIENTIFIC FOUNDATIONS OF PSYCHOLOGY (5).** An examination of man's attempts to understand himself and his attempts to understand the universe from the classical Greek era to the mid nineteenth-century.
604. **CONCEPTUAL AND THEORETICAL ANALYSIS IN PSYCHOLOGY (5).** Pr., PG 480 and PG 600 or COI. Techniques of conceptual analysis with reference to interpretation and integration of psychological data, and evaluation of alternative theories.
605. **DEVELOPMENTAL PSYCHOLOGY I (5).** An examination and critical analysis of research on selected topics and theories in developmental psychology.
606. **ADVANCED PSYCHOLOGY OF ABNORMAL CHILDREN AND ADOLESCENTS (5).** Pr., PG 601, PG 605 and COI. An examination of the current research and theory of behavioral, cognitive, and emotional disorders in childhood and adolescence.
607. **PSYCHOLOGICAL ASSESSMENT OF CHILDREN (5).** Pr., PG 606, 670. Psychology majors only, with supervised practicum. Introduction to the cognitive and personality assessment of infants, children, and adolescents.
608. **TECHNIQUES OF PSYCHOTHERAPY AND BEHAVIOR CHANGE WITH CHILDREN (5).** Pr., PG 607 and COI. Introduction to methods of prevention and treatment of cognitive, emotional, and behavioral disorders of children and adolescents.
610. **ADVANCED INDUSTRIAL PSYCHOLOGY (5).** Pr., PG 315 and 561 or COI. Analysis of major issues in industrial psychology.
611. **ADVANCED ORGANIZATIONAL PSYCHOLOGY (5).** Pr., PG 561 or COI. Analysis of major issues in organizational psychology.
612. **CLINICAL/INDUSTRIAL PSYCHOLOGY (5).** Pr., PG 610 and 611 or COI. Mental health issues in work organizations, and strategies of organizational intervention.
613. **PSYCHOMETRIC THEORY (5).** Pr., PG 515 and COI. Analysis of the mathematical models which underlie various approaches to psychological tests and measurements.
614. **INSTRUMENTATION IN INDUSTRIAL/ORGANIZATIONAL PSYCHOLOGY (5).** Pr., PG 610 and 611 or COI. Construction and use of measurement devices employed in industrial/organizational psychology.
616. **TOPICS IN INDUSTRIAL/ORGANIZATIONAL PSYCHOLOGY (5).** Pr., 610 and COI. In-depth analysis of specific topics in industrial-organizational psychology. May be repeated for a maximum of 15 hours credit.
619. **PRACTICUM IN INDUSTRIAL/ORGANIZATIONAL PSYCHOLOGY (1-5).** Pr., 20 graduate hours in industrial/organizational psychology and departmental approval. Individual supervised practicum in industrial/organizational psychology with an emphasis on the development of applied skills.
620. **EXPERIMENTAL PSYCHOLOGY I: LEARNING (5).** LEC. 4, LAB. 2. Pr., PG 320 or departmental approval. Analysis of learning, stressing experimental methodologies illustrative of major theoretical approaches.
621. **EXPERIMENTAL PSYCHOLOGY II: PSYCHOPHYSICS (5).** LEC. 4, LAB. 2. Pr., PG 321 or departmental approval. Physiology of receptor function and methodologies relating physical properties of stimulation to subject response variables.
622. **EXPERIMENTAL PSYCHOLOGY III: SOCIAL (5).** Pr., PG 601 or COI. Survey of Topics and literature in social psychology.
623. **TECHNIQUES IN THE ANALYSIS OF BEHAVIOR (5).** LEC. 2, LAB. 10. Pr., PG 620. Methods and techniques of operant research.
625. **EXPERIMENTAL DESIGN I (5).** Pr., PG 315 or departmental approval. Probability theory, sampling distributions, estimation procedures, and hypothesis testing.
626. **EXPERIMENTAL DESIGN II (5).** Pr., PG 625. Regression and correlation, analysis of variance, and nonparametric statistics.

629. **QUANTITATIVE METHODS FOR APPLIED RESEARCH (5).** Pr., PG 625 and 626. Analysis of time-dependent data and other quantitative problems of interest to applied professional psychologists.
631. **SOCIAL PSYCHOLOGY (5).** Pr., PG 531 or COI. Theories, research and issues in contemporary social psychology.
634. **GROUP BEHAVIOR CHANGE (5).** Pr., PG 637, 638 and departmental approval. Group psychotherapy and behavioral group techniques.
635. **THEORIES OF PERSONALITY (5).** Pr., PG 601. Analysis of current issues in personality theory.
636. **MOTIVATION AND REINFORCEMENT (5).** Pr., PG 600, PG 620 or COI. Recent literature on motivation and the process of reinforcement; critical review of current theories of motivation.
637. **ADVANCED PSYCHOLOGY OF ABNORMAL ADULTS (5).** Pr., PG 601. Current theoretical conceptions and research in psychopathology.
638. **SYSTEMS OF PSYCHOTHERAPY (5).** Pr., PG 635 and 637, or COI. A survey of theories and research related to modern systems of psychotherapy.
639. **PRACTICUM IN BEHAVIOR CHANGE (1-5).** Pr., PG 635, 637, 638 and/or COI. Must be taken at least four consecutive quarters. A minimum of 8 hours is required for Ph.D. in clinical psychology. May be repeated for a maximum of 20 hours. Psychology majors only. Individual supervision in psychotherapy and behavior change with emphasis on developing applied clinical skills.
640. **PHYSIOLOGICAL PSYCHOLOGY (5).** LEC. 2, LAB. 10. Pr., PG 621. Physiological basis of behavior.
645. **COMPARATIVE PSYCHOLOGY (5).** LEC. 2, LAB. 10. Pr., PG 620. Analysis of intra- and inter-species behavior emphasizing physical and physiological uniquenesses, response comparability, and generalizability, of behavioral principles.
650. **THEORIES OF LEARNING (5).** Pr., PG 620. A survey of major theories of learning.
651. **CURRENT DEVELOPMENTS IN THEORIES OF BEHAVIOR (5).** Pr., PG 550 and 650 or COI. Analysis and evaluation of current developments in theories of behavior.
652. **APPLICATIONS OF OPERANT PRINCIPLES (5).** Pr., PG 620, 623 or COI. Uses of operant principles in education, industry, economic and community-related behavior, ecological awareness and self-control.
654. **HUMAN OPERANT BEHAVIOR (5).** Pr., PG 620, 650 or COI. Critical survey of studies of human operant behavior and comparison with animal operant research.
655. **HUMAN INFORMATION PROCESSING (5).** LEC. 3, LAB. 4. Pr., PG 620 or departmental approval. A survey of the manner in which humans process information, beginning with environmental effects on the sense organs and proceeding through percepts, memories, and thoughts.
656. **BEHAVIOR MODIFICATION (5).** LEC. 3, LAB. 4. Pr., PG 601. Principles of behavior modification and practical experience to supplement classroom discussion.
657. **ADVANCED BEHAVIOR THERAPY (5).** Pr., PG 656 and/or COI. The application of behavior therapy procedures within a single-case methodological framework.
669. **OBJECTIVE TECHNIQUES OF ASSESSMENT (5).** Pr., PG 515. Theory and application of methods of objective measures of aptitudes, performance, and personality.
670. **ASSESSMENT OF INTELLIGENCE (5).** LEC. 3, LAB. 10. Pr., PG 669 and departmental approval. Theories of intelligence; supervised practice in the administration and interpretation of individual intelligence tests.
671. **PERSONALITY ASSESSMENT I (5).** LEC. 5. Pr., PG 669 and departmental approval. Theory and application of methods of personality measurement with emphasis on interview and self-report data, and on the interpretation of tests of specific behavioral deficits.
672. **PERSONALITY ASSESSMENT II (5).** LEC. 3, LAB. 6. Pr., PG 669 and departmental approval. Psychology majors only. Theory and application of methods of personality assessment with emphasis on projective techniques and supervised practicum experience.
673. **PERSONALITY ASSESSMENT III. (CREDIT TO BE ARRANGED.)** Psychology majors only. Supervised practicum in personality assessment. Maximum of 5 hours credit may be applied to minimum requirements for master's degree.
676. **TEACHING OF PSYCHOLOGY (1-3).** Pr., departmental approval. (S-U grading only.) The problems and practices of teaching psychology at the college level. In addition to seminar meetings, students will work with senior faculty in appropriate courses. May be taken more than one quarter; credit in this course case cannot count toward fulfilling the minimum 45 graduate hours for a master's degree.
680. **CURRENT RESEARCH IN PSYCHOLOGY (2).** Pr., COI. Review of current research on selected topics in psychology. Six hours credit in this course required of all doctoral students. May be repeated for a maximum of 10 hours credit.
690. **SEMINAR. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter but not more than one registration permitted in any one quarter.
692. **RESEARCH IN SPECIAL TOPICS. (CREDIT TO BE ARRANGED.)** S-U grading only. May be taken more than one quarter but not more than one registration permitted in any one quarter.
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)** May be repeated for credit.
799. **RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)** May be repeated for credit.

Rehabilitation and Special Education (RSE)

Professor Porter

Associate Professors Couch, Head, Eaves, and Wood
Assistant Professors Anderson, Cosgrove, Diebold, Kaufman,
Kelley, McDaniel, Morgan, Sexton, Shinnick,
Simpson, Stramiello, and Tomlin

Instructor Haynes

Research and Extension Associates Autrey, Baker, Barker,
Black, Bradberry, H. Brown, J. Brown, M. Brown,
Burdg, Callander, Edwards, Gray, Helm, Holm,
Jones, Kellum, Miller-Wood, Mitchell,
Neeley, Person, Rickicki, Sigmon, Strawn, and Weldon

**Certain sections of common offerings are identified by use of letter designations as noted below:

(G) Gifted and Talented, (L) Learning Disabilities, (N) Speech Pathology, (O) Emotional Disturbance, (P) Mental Retardation, (Q) General Rehabilitation and Special Education, (R) Rehabilitation, and (S) Early Childhood Education for the Handicapped.

UNDERGRADUATE

- 102.** **ORIENTATION FOR TRANSFER STUDENTS (1).** Helps transfers from other curricula and students outside the dual objectives program to understand teacher education and teaching as a profession.
- 104.** **ORIENTATION TO LABORATORY EXPERIENCES FOR TRANSFER (1).**
330. **CAREERS IN REHABILITATION SERVICES (5).** History, legal basis, and fields of rehabilitation services. Exploration of specialty fields in medical and vocational rehabilitation such as occupational and physical therapy, speech pathology, social work, vocational evaluation, adjustment services, and rehabilitation counseling. Emphasis on those working with disabled persons and adjustment to disability.
376. **A SURVEY OF EXCEPTIONALITY (5).** An introduction to the several types of exceptionality with an emphasis upon the educational and training implications of each.
377. **INTRODUCTION TO MENTAL RETARDATION (5).** Pr., RSE 376 or COI. An introductory exploration of mental retardation as a special type of exceptionality with emphasis placed upon implications for the education and training of the retarded.
378. **AN INTRODUCTION TO BEHAVIOR DISTURBANCE (5).** Pr., RSE 376 or COI. An introductory exploration of behavior disturbance as a special type of exceptionality with emphasis placed upon implications for the education and training of the behavior disturbed.
414. **ASSESSMENT TECHNIQUES IN REHABILITATION (3).** LEC. 2, LAB. 2. Pr., admission to Teacher Education and FED 320 or equivalent. Program planning principles involved in designing program activities for specific area of specialization.
415. **TEACHING AND BEHAVIORAL CHANGE IN REHABILITATION (3-5).** LEC. 2, LAB. 2. Pr., admission to Teacher Education and FED 320 or equivalent. Understanding of curriculum content, methods and techniques of instruction using appropriate instructional materials, planning and evaluation of instruction for specific area of specialization.
- 420.** **ORGANIZING INSTRUCTION FOR SPECIAL EDUCATION (5).** LEC. 4, LAB. 4. Pr., RSE 376, 378, or COI. Provides the student with skills necessary to organize the special education instructional program in area of specialization.
421. **EDUCATIONAL DIAGNOSIS AND ASSESSMENT IN SPECIAL EDUCATION (5).** LEC. 3, LAB. 2. Pr., FED 400. Application of concepts in measurement and evaluation in education: Selection/Construction of instruments, collection, summarization, and interpretation of diagnostic/assessment data. Emphasis is on diagnostic/assessment instruments most appropriate for referred exceptional students.
- 425.** **PROFESSIONAL INTERNSHIP (15).** Pr., senior standing, admission to Teacher Education prior to Internship, appropriate professional courses. Provides supervised, on-the-job experiences in a school, college, or other appropriate setting. These experiences will be accompanied by regularly scheduled discussion periods designed to provide positive evaluation and analysis of the intern experience.
- 445.** **DIRECTED INDEPENDENT STUDY (1-10).** The student's learning efforts are guided toward desired objective. Includes evaluation by professor and student of work accomplished at regular intervals.
- 450.** **SPECIAL TOPICS (1-5).** Seniors and professors pursue cooperatively selected concepts and theoretical formulations.
- 479.** **METHODS AND MATERIALS FOR TEACHING IN SPECIAL EDUCATION (5).** Pr., RSE 376 and 378 and 420.
- 495.** **PRACTICUM (1-10).** Provides experiences closely relating theory and practice, usually carried on simultaneously.

PRIMARILY FOR ADVANCED UNDERGRADUATE AND GRADUATE

505. **NATURE AND NEEDS OF THE GIFTED AND TALENTED (4).** Provides opportunities for students to develop knowledge about the field of gifted education and awareness of the nature and needs of high ability children. Emphasis on history, philosophy, and underlying assumptions of gifted education. Identification and characteristics of high ability children.
510. **OCCUPATIONAL INFORMATION (3). LEC. 2, LAB. 2.** Pr., junior standing. (Also listed as VED 510.)
529. **LEARNING DISABILITIES (5).** Pr., RSE 376 or RSE 600 or COI. junior standing. Theoretical issues, research, diagnosis, and educational approaches involved with children with learning disabilities. Observations of educational settings for children with learning disabilities are required.
- 530.* **EVALUATION AND TRAINING IN VOCATIONAL REHABILITATION (4). LEC. 3 HOURS DAILY FOR 6 WEEKS, INTERNSHIP 4 WEEKS.** Pr., junior standing. Purposes, principles and techniques of client evaluation and training, including personal, social and physical adjustment, vocational choice and selected techniques used in the evaluation and training process.
- 531.* **RESEARCH IN EVALUATION AND TRAINING IN VOCATIONAL REHABILITATION (4). LEC. 3 HOURS DAILY FOR 6 WEEKS, INTERNSHIP 4 WEEKS.** Pr., junior standing. A problem using research techniques, to be selected in consultation with the supervising professor.
- 532.* **INSTRUCTIONAL PROGRAMS IN WORKSHOPS AND REHABILITATION FACILITIES (5).**
- 533.* **MANAGEMENT OF VOCATIONAL REHABILITATION WORKSHOPS AND FACILITIES (5).**
535. **INTRODUCTION TO VOCATIONAL EVALUATION (5).** Pr., junior standing. History, philosophy, theoretical bases, and present status of vocational evaluation. Survey of the vocational evaluation process, principles, techniques, and procedures. Innovative methodology and future trends in vocational evaluation are explored.
536. **SYSTEMS OF VOCATIONAL EVALUATION (3). LEC. 1, LAB. 4.** Pr., VED 535, junior standing. Instruction and supervised practice in the application of the GATB, the JEVS system, the TOWER system, the Singer/Graflex system and related techniques of vocational evaluation.
537. **OCCUPATIONAL ORIENTATION FOR THE DEVELOPMENTALLY DISABLED (5).** Pr., junior standing. Principles for providing occupational orientation and work experience techniques of curriculum planning, job classification and evaluation, selection, and placement, curricular activities related to work experience, community agencies and public relations.
538. **WORK ADJUSTMENT IN REHABILITATION (5).** Pr., junior standing, 10 hrs. Psychology, 10 hrs. Rehab. Introduction to the history, development, theoretical base, and techniques of work adjustment in rehabilitation.
540. **INTRODUCTION TO MANUAL COMMUNICATION WITH THE DEAF (4).**
541. **AMERICAN SIGN LANGUAGE (4).** Pr., COI.
542. **SURVEY REHABILITATION WITH THE BLIND AND VISUALLY HANDICAPPED (4).**
543. **VOCATIONAL EVALUATION AND ADJUSTMENT OF BLIND AND VISUALLY HANDICAPPED (4).**
544. **SURVEY OF REHABILITATION WITH DEAF AND HEARING IMPAIRED (4).**
546. **VOCATIONAL EVALUATION OF DEAF AND HEARING IMPAIRED (4).**
549. **SYSTEMS OF VOCATIONAL EVALUATION FOR THE RETARDED (3). LEC. 1, LAB. 4.** Pr., RSE 535, junior standing. Instruction and supervised practice in the development, evaluation, and application of commercial systems of vocational evaluation for use with the mentally retarded.
550. **LANGUAGE DEVELOPMENT FOR THE YOUNG HANDICAPPED CHILD (5).** Pr., junior standing and COI. A systematic, analytic approach to intervention programming for speech and language development with the young handicapped child.
- 556.** **LEARNING RESOURCES IN AREA OF SPECIALIZATION (4).** Pr., junior standing.
561. **EXCEPTIONAL CHILDREN IN THE REGULAR CLASSROOM (5).** Provides regular education and related support personnel with knowledge and skills reflecting identification, characteristics, and education of exceptional children in the regular classroom.
580. **EDUCATION OF CHILDREN WITH SPECIAL LEARNING DISABILITIES (5).** Pr., RSE 376, RSE 529, junior standing and COI. Existing theories and instructional programs for children with special learning disabilities. Administrative arrangements, classroom management, individual educational evaluation and programming are emphasized.
586. **THE SEVERELY MENTALLY RETARDED (5).** Pr., RSE 376, junior standing and COI. An in-depth study of severe mental retardation as a special type of exceptionality with emphasis upon implications for the education and training of the severely retarded.

PRIMARILY FOR GRADUATE

600. **ADVANCED STUDY OF EXCEPTIONALITY (5).** Pr., appropriate undergraduate preparation in Special Education or COI. An advanced study of the several types of exceptionality with an emphasis upon the educational and training implications of each.

501. **ADVANCED STUDY OF EDUCATIONAL ASPECTS OF MENTAL RETARDATION (5).** Pr., RSE 376, or RSE 600, or COI. An advanced study of mental retardation as a special area of exceptionality with emphasis upon the education and training needs of the retarded.
502. **EDUCATIONAL DIAGNOSIS AND ASSESSMENT FOR SPECIAL LEARNING PROBLEMS (5).** Pr., RSE 376 and FED 661. A comprehensive study of tests and procedures for diagnosing special learning problems. In-depth instruction in educational assessment in such areas as perceptual-motor, language, academic aptitude, and achievement.
503. **PRESCRIPTIVE TEACHING FOR SPECIAL LEARNING PROBLEMS (5).** Pr., RSE 376, RSE 602 and FED 661. In-depth instruction in specialized methods of prescriptive program planning based on educational assessments of children with learning problems. Development and presentation tasks are included.
510. **INTRODUCTION TO REHABILITATION PROGRAMS, PROFESSIONS, AND SERVICES (2).** History, parameters, career opportunities, and issues in vocational rehabilitation and roles of various professions.
- 625.** **INTERNSHIP (5-15).** Provides advanced students with supervised, on-the-job experiences in a school, college, or other appropriate setting. These experiences will be accompanied by regularly scheduled on-campus discussion periods designed to provide positive evaluation and analysis of the intern experience.
630. **DIAGNOSTIC VOCATIONAL EVALUATION (4).** Pr., PG 515 or equivalent. Process, principles, and techniques used to diagnose general assets and liabilities of the individual. Includes the functional and analysis of biographical data and the use of the evaluation interview. Emphasis is placed upon the rationale underlying the selection and use of psychometric tests in vocational evaluation.
631. **PROGNOSTIC VOCATIONAL EVALUATION (4).** Pr., RSE 630 or permission of department head. Process, principles, and techniques used to determine and predict work behavior and vocational potential. Includes the rationale underlying the selection and use of occupational exploration programs, work samples, situational tasks, simulated work experiences, and job tryouts in vocational evaluation.
632. **USE OF INTERPRETATION OF VOCATIONAL EVALUATION DATA (4).** Pr., RSE 630 and 631 or COI. Process, principles, and techniques used in the interpretation of vocational evaluation data to clients, to rehabilitation personnel, and to facility staff. Focuses upon the interpretation of data through the formal staff conference, vocational counseling, report writing, and follow-up.
634. **WORK SAMPLE DEVELOPMENT (5).** Pr., COI. Theoretical and technical principles related to the development, standardization and validation of work samples. Supervised experience in the application of work sample development principles.
643. **EDUCATION OF THE PHYSICALLY HANDICAPPED (5).** Pr., adequate courses in physiology and psychology and COI. The characteristics of major physical disabilities; the psychology of the physically handicapped; the educational objectives with curriculum adaptations; and related aspects of a total program for the physically handicapped.
644. **COMMUNICATION SYSTEMS FOR NONVERBAL HANDICAPPED CHILDREN (5).** LEC. 4, LAB. 2. Pr., RSE 600, RSE 643, or COI. Provides students with a knowledge and experience base necessary for developing, implementing, and evaluating individualized communication skill training programs for severely/profoundly handicapped children who are nonverbal.
- 646.** **DIRECTED INDEPENDENT STUDY (1-6).** Special study in which the student's learning efforts are guided toward desired objectives. Includes evaluation by professor and student at regular intervals.
649. **TEACHING THE MENTALLY RETARDED (5).** Pr., RSE 376, RSE 378, and RSE 479P. Provides for observation and participation under supervision in educational programs for the mentally retarded. Lectures and discussions will implement the student's work in the classroom. Students will develop and evaluate plans and programs for the special class. (For teachers pursuing a program of education for mentally retarded children.)
- 650.** **SEMINAR IN AREAS OF SPECIALIZATION (3-10).** May be repeated for credit not to exceed 10 hours. Provides an opportunity for advanced graduate students and professors to pursue cooperatively selected concepts and theoretical formulations.
- 651.** **RESEARCH STUDIES IN EDUCATION IN AREAS OF SPECIALIZATION (5).** Review, analysis, and interpretation of available research with emphasis on designing new research to meet the changing needs of the school.
- 652.** **CURRICULUM AND TEACHING IN AREAS OF SPECIALIZATION (5).** Teaching practices and reappraisal of selecting experiences and content for curriculum improvement.
- 653.** **ORGANIZATION OF PROGRAM IN AREAS OF SPECIALIZATION (5).** Program, organization, and development of basic and supplementary materials for guiding teachers, faculties, and school systems in the continuous improvement of curriculum and teaching practices.
654. **EVALUATION OF PROGRAM IN AREAS OF SPECIALIZATION (5).** Evaluation and investigation of teaching effectiveness with attention also given to the utilization of human and material resources and the coordination of areas of specialization.
670. **EDUCATIONAL PROCEDURES FOR CHILDREN WITH BEHAVIOR DISORDERS (5).** Pr., graduate standing and COI. Analysis of current provision for children with emotional conflicts, with emphasis on educational procedures and implications for learning disabilities.
671. **CURRENT RESEARCH ON THE BEHAVIORAL DISORDERS OF CHILDREN (5).** Pr., graduate standing and COI. Examination and interpretation of research. Emphasis on educational implications of emotional conflict, classroom guidance and control.
- 695.** **PRACTICUM (1-15).** Provides advanced students with experiences closely relating theory and practice. Usually carried on simultaneously.

- 696. GRADUATE RESEARCH FORUM (1).** May be repeated, but counted only once toward graduation. Presentations by graduate students of research proposals and/or findings. Analysis of procedures and findings.
- 699. RESEARCH AND THESIS (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.
- 798. FIELD PROJECT. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.
- 799. RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.

*Offered only to participants in training programs for workshop and facility personnel in State and Regional offices of Vocational Rehabilitation.

Religion (RL)

Associate Professor Kuykendall, *Acting Head*
Instructor Dawsey

- 201. INTRODUCTION TO RELIGION (3).** Major themes in religion, including religious experience, religion and society, and the diversity of religion. Examples from various religious traditions.
- 210. INTRODUCTION TO THE OLD TESTAMENT (5).** Historical-critical study of the Old Testament in its cultural setting. Emphasis upon development of Old Testament thought.
- 220. INTRODUCTION TO THE NEW TESTAMENT (5).** Historical-critical study of the New Testament in its cultural setting. Major issues in New Testament study.
- 230. HISTORY OF CHRISTIANITY (5).** Development of Christianity from 100 A.D. to the present. Major personalities, events, and movements.
- 245. RELIGION AND POPULAR CULTURE (5).** Religious themes and developments in contemporary American life.
- 301. WORLD RELIGIONS (5).** Hinduism, Buddhism, Taoism, Confucianism, and Islam, with secondary attention to other Asian religions.
- 325. PAUL (5).** Pr., RL 220. Life, letters and thought of the Apostle Paul.
- 335. HISTORY OF CHRISTIAN THOUGHT (5).** Representative trends and thinkers from 100 A.D. to 1600 A.D.
- 340. RELIGION IN AMERICA (5).** Religious activities, institutions and personalities in North America from the Colonial Period to the present.
- 350. CONTEMPORARY RELIGIOUS THOUGHT (5).** Pr., one course in religion. Major twentieth century theologians—Protestant, Catholic, Jewish.
- 365. RELIGIOUS VALUES AND SEXUALITY (5).** Pr., one course in religion. Religious views of human sexuality from biblical times to the present. Emphasis upon contemporary period.
- 450. SEMINAR (5).** Pr., senior standing. An intensive examination of a major topic in religious studies.
- 490. READINGS IN RELIGION (3-5).** Pr., junior standing and COI. A program of independent study on a special topic. May be repeated for credit.

Secondary Education (SED)

Professors Atkins, *Head*, Alley, Easterday, and Weaver
Associate Professors Graves, Henry, Johnson, Justice, and Rowsey
Assistant Professors Ley and Melvin
Adjunct Instructor Danner

Courses for Undergraduate Students

- 102. ORIENTATION FOR TRANSFER STUDENTS (1).** Helps transfers from other curricula and students enrolled in other schools to understand teacher education and teaching as a profession as well as become acquainted with the preparation program in their areas of specialization.
- 104. ORIENTATION TO LABORATORY EXPERIENCES FOR TRANSFERS. (1).** Required of students completing the Teacher Education Program. Orientation to the Laboratory Experiences Program with specific attention to the orientation and initiation of the Pre-Teaching Field Experience Program and the Professional Internship.
- 110-111-112. DEVELOPMENTAL STUDIES 1, 2, 3 (2). (CREDIT NOT COUNTED TOWARDS GRADUATION.)** Designed to develop skills conducive to successful college study. Emphasis on reading skills and their relation to other language arts. Attention is given to study skills, communication skills for formal and informal use, and cultural aspects of communication.

- 201. EDUCATION (2).** Designed to help prospective teachers in the guidance of students. (A) Art Expression, (P) Communication Problems, (Q) Materials of Instruction, (R) Improvement in Reading.
- 201L. EDUCATION (1). LAB. 2.** Laboratory will be taken concurrently with the corresponding lecture course or independent of the lecture.

Curriculum and Teaching

Undergraduate students with both a teaching major and minor in Secondary Education must take one course in Teaching (SED 405) and one course in Program (SED 410) in the major field and one course in either Teaching or Program in the minor field. Where no minor exists, the latter is not required. Undergraduate students in English Education must take SED 411, 412 and 413 instead.

Students specializing in Art, Music, Speech Communication or Theatre will be certified to teach in both elementary and secondary schools. Such students must complete both the Teaching and Program courses in the teaching field or fields in which certification is expected.

Teaching and Program courses may be scheduled and taught as separate courses, related courses, or as a unified program. Admission to Teacher Education is prerequisite for Teaching and Program courses.

For some courses, there are special sections denoted by a letter code corresponding to the areas of specialization. These areas are: (D) Foreign Language, (G) English (H) Mathematics, (K) Science, and (L) Social Science and (U) Journalism. Courses dealing with (A) Art, (C) Theatre, and (M) Speech Communication, are offered as inter-departmental (IED) courses.

- 375. SCIENCE FICTION IN THE SECONDARY SCHOOL PROGRAM (5).** Selected works of science fiction with emphasis on the use of this genre to augment the teaching in the content areas of the secondary school curriculum.
- 400. APPLIED LINGUISTICS FOR FOREIGN LANGUAGE TEACHERS (3).** The Application of linguistics in the teaching of foreign languages.
- 401. TEACHING MATHEMATICS: MIDDLE SCHOOL (4). LEC. 3, LAB. 2.** Specific teaching strategies for a comprehensive middle school mathematics program.
- 402. MATHEMATICS PROGRAM AND TEACHING I (3). LEC. 2, LAB. 2.** Emphases as diagnostic and prescriptive procedures, theories of learning applied to managing and evaluating mathematics programs.
- 403. MATHEMATICS PROGRAM AND TEACHING II (3). LEC. 2, LAB. 2.** Emphases are historical bases for school mathematics programs, planning, procedures, instructional strategies, and teaching of problem solving.
- 404. TEACHING MATHEMATICS: APPLICATION AND TECHNOLOGY (3). LEC. 2, LAB. 2.** Uses of calculators and computers in school mathematics and the teaching of applications in mathematics.
- 405.* TEACHING IN SECONDARY SCHOOL (3). LEC. 2, LAB. 2.** Pr., FED 320, or COI.
- 410.* PROGRAM IN SECONDARY SCHOOL (3). LEC. 2, LAB. 2.** Pr. FED 320, or COI.
- 411. TEACHING ENGLISH: LANGUAGE AND LINGUISTICS (3). LEC. 2, LAB. 2.** Pr., FED 320, or COI. Specific teaching strategies in language and linguistics.
- 412. TEACHING ENGLISH: LITERATURE (3). LEC. 2, LAB. 2.** Pr., FED 320, or COI. Specific teaching strategies in literature.
- 413. TEACHING ENGLISH: RHETORIC AND COMPOSITION (3). LEC. 2, LAB. 2.** Pr., FED 320, or COI. Specific teaching strategies in rhetoric and composition.
- 415. CURRENT TRENDS AND PRACTICES IN AREAS OF SPECIALIZATION (3). LEC. 2, LAB. 2.** Pr., FED 350, or COI. The study and application of contemporary curriculum and instructional trends and practices within the areas of specialization of the secondary school program.
- 419. THE MIDDLE SCHOOL (5). LEC. 4, LAB. 3.** Pr., FED 300, admission to Teacher Education, junior standing. Historical perspectives and rationale for the development of the middle school program. Analysis of middle school organization and selected programs. Laboratory experiences are required.
- 420. THE SECONDARY SCHOOL (5).** Current thinking about the organization and purpose of secondary schools.
- 421. SOCIAL SCIENCE CONCEPTS AND METHODS (5).** Pr., 25 hours in social sciences. The structure, key concepts, and methods of investigation of the social sciences. Emphasis is placed on those social sciences taught in secondary schools.
- 425. PROFESSIONAL INTERNSHIP (15).** Pr., senior standing, admission to Teacher Education prior to Internship, appropriate professional courses. Supervised teaching in a school, accompanied by scheduled discussions designed to analyze and evaluate the intern's experience.

- 446. DIRECTED INDEPENDENT STUDY (1-10).** Planned individual inquiry, including evaluation by professor and student at regular intervals.
- 450. SPECIAL TOPICS (1-5).** Cooperative pursuit of selected concepts and theories, normally in small groups.
- 495. PRACTICUM (1-10).** Experiences designed to allow individual students to relate theory and practice.

*410L is a prerequisite for 405L.

ADVANCED UNDERGRADUATE AND GRADUATE

- 501. LANGUAGE STUDY FOR TEACHERS (5).** Linguistics in the school curriculum; the child's acquisition of syntax; theories of teaching usage, dialectology, lexicography, and grammar; English as a second language, non-verbal communication in the classroom; research studies in language and linguistics and their applications to classroom teaching.
- 502. RHETORIC AND COMPOSITION FOR TEACHERS (5).** Topics and current trends in teaching rhetoric and composition. Classical and new rhetorics; theories of paragraph analysis; behavioral approaches to composition; pupil motivation and the composing process; current research; evaluation.
- 570. READING IN THE CONTENT AREAS OF THE SECONDARY SCHOOL (5).** Reading problems in content areas of the secondary school and special methods of helping students overcome these problems.
- 575. PROBLEMS IN IMPROVEMENT OF READING AT THE SECONDARY SCHOOL LEVEL (5).** Pr., teaching experience or COI. Problem areas of effective reading instruction in developmental reading. Grades seven through twelve. Emphasis on techniques and materials for the teaching of comprehension, study skills, vocabulary, and other related areas in the reading program and in the content areas of the secondary school.
- 576. THE READING OF ADOLESCENTS (5).** Pr., SED 575 or COI. Use of adolescent and popular adult literature in the secondary school reading program. Motivation of the reluctant reader; criteria for evaluating reading materials; and self-selection/self-pacing reading programs in the English or reading classroom.

GRADUATE

- 625. INTERNSHIP (5-15).** Supervised, on-the-job experiences in a school, college, or other appropriate setting. These experiences accompanied by regularly scheduled, on-campus discussion periods and evaluation and analysis of the intern experience.
- 640-641. ADVANCED STUDY OF HIGH SCHOOL GENERAL SCIENCE (5).** Intensive study of selected topics from the area of the high school general science program.
- 646. DIRECTED INDEPENDENT STUDY (1-6).** The student's learning efforts are guided toward desired objectives. Includes evaluation by professor and student of work accomplished at regular intervals.
- 649. THE SECONDARY SCHOOL PROGRAM (5).** For advanced graduate students. Major curriculum areas and teaching practices in the modern secondary school. Attention given to implications of research and theory for the total secondary school program.
- 650. SEMINAR (3-10).** May be repeated not to exceed 10 hours.
- 651. RESEARCH STUDIES IN EDUCATION IN AREAS OF SPECIALIZATION (5).** Review, analysis, and interpretation of available research with emphasis on designing new research to meet the changing needs of the school.
- 652. CURRICULUM AND TEACHING IN AREAS OF SPECIALIZATION (5).** Teaching practices and reappraisal of selecting experiences and content for curriculum improvement.
- 653. ORGANIZATION OF PROGRAM IN AREAS OF SPECIALIZATION (5).** Program, organization, and development of basic and supplementary materials for guiding teachers, faculties, and school systems in the continuous improvement of curriculum and teaching practices.
- 654. EVALUATION OF PROGRAM IN AREAS OF SPECIALIZATION (5).** Evaluation and investigation of teaching effectiveness with attention also given to the utilization of human and material resources and the coordination of areas of specialization.
- 695. PRACTICUM. (1-15).** Students get experiences closely relating theory and practice, usually carried on simultaneously.

The following research/field project credit options are available in each department according to the levels of degree study offered in the department.

- 699. RESEARCH AND THESIS (CREDIT TO BE ARRANGED).** May be taken more than one quarter.
- 798. FIELD PROJECT. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.
- 799. RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.

Sociology (SY) and Anthropology (ANT)

Professor Griessman

Associate Professors Adams, Head, Busch, Mohan, Starr, Shields, and Wilke

Assistant Professors French, Gundlach, Kowalski, Reid,
and Wilson

Instructors Cottier, Lewis, and Morgan

Joint appointees: Associate Professor Dunkelberger

Assistant Professors Vanlandingham and Molnar

Sociology (SY)

201. **INTRODUCTION TO SOCIOLOGY (5).** Principles and processes of society. Open to Freshman.
202. **SOCIAL PROBLEMS (5).** Pr., SY 201. A sociological analysis of current social problems such as crime, mental illness, race relations, poverty, aging, etc.
204. **SOCIAL BEHAVIOR (5).** Pr., SY 201 or PG 211. Integrated social psychological factors which influence or determine human behavior; the emphasis is upon the normal individual and/or group situations.
220. **STATISTICS (5).** Pr., SY 201. Basic statistical concepts, measures, and techniques used in sociological reports and research.
301. **SOCIOLOGY OF THE FAMILY (5).** Pr., SY 201. The American Family in perspective. Theory and method in sociological studies of the family.
302. **CRIMINOLOGY (5).** Pr., SY 201, junior standing. The causes of crime and its social treatment. Field trips required.
304. **MINORITY GROUPS (5).** Pr., junior standing. Racial composition of the United States with special emphasis on the adjustment of minority groups to the core society.
308. **JUVENILE DELINQUENCY (3-5).** Pr., SY 201. Historical and contemporary considerations relative to the juvenile offender. The emphasis is upon research data from the various sciences attempting to deal with this problem.
310. **SOCIAL ORGANIZATION (5). ALTERNATE YEARS.** Pr., SY 201 or COI. Focuses on the systems of roles, norms, and shared meanings that provide regularity in social interaction.
317. **SOCIOLOGY OF MENTAL ILLNESS (5).** Pr., SY 201. Examines major sociological theories and research concerning emergence, definition and treatment of mental disorders in different cultural contexts; emphasizes role of social institutions involved.
350. **SOCIOLOGY COLLOQUIUM (1).** Pr., SY 201. Designed to orient sociology majors toward major substantive fields of the discipline. May be repeated for maximum of 3 credit hours.
370. **METHODS OF SOCIAL RESEARCH (5).** Pr., SY 201 or RSY 361. The principal methods of data collection and analysis in sociological research. Same as RSY 370. Credit in RSY 370 precludes credit in SY 370.
403. **ADVANCED TOPICS IN SOCIAL PROBLEMS (5).** Pr., SY 201 and junior standing. An in-depth examination of specific claims and areas of social problems.
409. **SOCIAL THOUGHT (5).** Pr., SY 201 or COI. Focus on pre-Comtian ideas bearing on the definition and emergence of social and behavioral theory.
410. **TOPICS IN SOCIOLOGY OF KNOWLEDGE — COGNITIVE ANTHROPOLOGY (5).** Pr., SY 201 or COI. An interdisciplinary approach to the understanding of human knowledge emphasizing cognitive anthropology and sociology of knowledge. Credit for this course precludes credit for ANT 410.
411. **SOCIAL CHANGE (5).** Pr., SY 201 or COI. Major theoretical and research perspectives in social and developmental change.
477. **SOCIOLOGY OF AGING (3).** Pr., SY 201. A social-cultural treatment of the phenomena of aging emphasizing recent theory and research.

ADVANCED UNDERGRADUATE AND GRADUATE

501. **POPULATION PROBLEMS (5).** Problems of quantity and quality of population including problems of composition, distribution, and migration. Attention is given to Alabama population.
502. **SOCIAL THEORY (5).** Pr., SY 201 or COI. Survey of theorists from Comte to the present; emphasizes theory construction, theoretical analysis, and differences in theoretical approaches.
504. **SOCIOLOGY OF POWER (5).** Pr., SY 201. A systematic concern with the dimensions and distribution of power in social life.
505. **URBAN SOCIOLOGY (5).** Growth and decline of cities with special emphasis on ecological and demographic characteristics, associations and institutions, class systems, and housing and city planning.
507. **PUBLIC OPINION AND PROPAGANDA (5).** Pr., SY 201. The area of social communication; the formation, place and importance of publics in modern society, of public opinion research, and of propaganda and public relations techniques.

- 508. INDUSTRIAL SOCIOLOGY (5).** Pr., SY 201. The sociological approach to business organization and industrial relations. Emphasis given to organization principles operative in the economic life within a social system such as a factory or business establishment.
- 509. SOCIOLOGY OF RELIGION (5).** Pr., SY 201 or COI. Analysis of religion as a social institution as found in the world's great religions.
- 514. FIELD INSTRUCTION (1-10).** Pr., COI. Supplementary instruction concurrent with experience in some field of work involving application of sociological perspectives to community life. May be repeated for a maximum of 10 hours credit.
- 515. SOCIAL STRATIFICATION (5).** Pr., SY 201. Stratification as a fundamental feature of all societies. Past thought and current research and theory on structured social inequalities is systematically developed.
- 518. SOCIOLOGY OF OCCUPATIONS (5).** Pr., SY 201. A comprehensive examination of specific occupational categories ranging from professional to service occupations. Special emphasis is placed on the relationship of occupational structure and institutions and the meaning of occupations for individuals and society.
- 520. RACIAL AND ETHNIC RELATIONS (5).** Pr., 10 hours of SY or COI. Utilizes cross-cultural data to describe situations in which race or ethnicity affect human behavior. These data interpreted by delineating patterns, trends, and relationships.
- 522. SPECIAL TOPICS IN SOCIOLOGY (1-5).** Pr., SY 201 or COI. Examines selected topics from a sociological perspective. May be repeated for a maximum of 10 hours.
- 525. SOCIAL DEVIANCE (5).** Analysis of factors in the creation of and reaction to social deviance. Examines various theoretical approaches to deviance, with particular emphasis on how behavior comes to be defined as deviant.
- 526. PENOLOGY (5).** Pr., SY 302. The history and development of corrections with particular emphasis upon modern rehabilitative processes.
- 528. SMALL GROUPS (5).** Pr., SY 204, PG 330, or COI. Small group research and theory covering such areas as interpersonal exchange, group formation, social influence, and problem-solving behavior.
- 530. CONTEMPORARY CORRECTIONS (5).** Pr., SY 302 or 526 or COI. Examination of current adult correctional programs and practices. Emphasis on community corrections.
- 534. SOCIALIZATION (5).** Pr., SY 201. Examines an important and distinct sociological tradition: mind, self, society and interaction as symbolic phenomena grounded in social processes. Covers major intellectual influences, concepts, and figures (e.g., James, Mead, Cooley).
- 550. DIRECTED READING (1-5).** Pr., COI, junior standing. An independent reading program, under supervision, to provide for the pursuit of specific interests in sociology not covered by other course offerings. May be repeated for a maximum of 10 hours credit.
- 577. SEMINAR IN MEDICAL SOCIOLOGY (5).** Pr., SY 201 or COI. The nature and organization of medical practice and health delivery systems. Special attention to role of physicians and various views of patients and disease. Relationship between culture, politics, and health.

GRADUATE

- 602. SEMINAR IN THE FAMILY (5).** Pr., SY 301 or COI. Study of the institutions of marriage, family, and kinship from a comparative and historical perspective.
- 603. SOCIAL PROBLEMS (5).** Pr., SY 202 and COI. Special social problems such as old age, crime and delinquency, minorities, etc., within the framework of social problem theory.
- 604. SEMINAR IN RACE AND CULTURE (5).** Pr., SY 201 and 304 or COI. Adjustment of races to culture with particular reference to the South; the historical and cultural background of the races in America; bi-racial system; problems of race relations.
- 608. ORGANIZATIONAL ANALYSIS (5).** A theoretical and empirical examination of the principal features of large-scale organizations in contemporary society. Directed research into particular organizational areas of present-day social life.
- 610. SEMINAR IN SOCIAL BEHAVIOR (5).** Pr., SY 204, PG 330, or COI. Research and theory concerning social and group influences on behavior.
- 619. THEORY CONSTRUCTION (5).** Pr., SY 201; SY 409 or 502, or COI. Orientation and insight into the logic of theory construction in the social sciences, and the complementary problems of articulating research findings with theory.
- 620. ADVANCED SOCIOLOGICAL THEORY (5).** Pr., COI. This course reviews principal types of sociological theory, exchange theory, and structural functionalism. It focuses on significant theoretical issues.
- 630. STATISTICAL APPLICATIONS IN SOCIOLOGICAL RESEARCH (3-5).** Pr., SY 220 or COI. A general survey of uses and limitations of statistical techniques used in sociology.
- 650. SOCIOLOGY SEMINAR (5).** Pr., COI. Designed for students engaged in intensive study and analysis of sociological subject areas. May be repeated for a maximum of 10 credit hours.
- 680. INDEPENDENT STUDY (1-5).** Under supervision, to read and study materials in some substantive area of sociology.
- 699. RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)** May be repeated for credit.

Rural Sociology

(For course descriptions, see Department of Agricultural Economics and Rural Sociology.)

Anthropology (ANT)

- 203. **INTRODUCTION TO ANTHROPOLOGY (5).** Pr., sophomore standing. The anthropological perspective from the four major fields of anthropology: physical, cultural, archaeological, and linguistic.
- 206. **CULTURAL ANTHROPOLOGY (5).** Pr., ANT 203. The nature of culture. Comparative approach to the study of the principal institutions of human society and basic categories of human behavior.
- 207. **INTRODUCTORY ARCHAEOLOGY (5).** The history, principles, and methods for investigating and reconstructing past cultures.
- 303. **HISTORY OF ANTHROPOLOGICAL THEORY (5).** Pr., ANT 203. The development of ethnological theory.
- 305. **CULTURE AND PERSONALITY (3).** Pr., SY 201 or ANT 203. Socio-cultural factors in personality development and recent studies in national character.
- 306. **INTRODUCTION TO PHYSICAL ANTHROPOLOGY (5). LEC. 3, LAB. 3.** Pr., ANT 203. Human origins and development; contemporary primate varieties, using a genetic and anthropometric approach.
- 314. **ANTHROPOLOGY OF WORK (3).** Pr., junior standing. Anthropological theory and data applied to problems of various work settings.
- 401. **KINSHIP, MARRIAGE AND THE FAMILY (5).** Pr., ANT 203 or SY 301. The comparative study of human patterns of marriage, child rearing, inheritance, descent and kinship.
- 403. **CONTEMPORARY ANTHROPOLOGY (5).** Pr., ANT 203. junior standing. Contemporary research and theory regarding primitive, traditional, and urban cultures.
- 410. **TOPICS IN SOCIOLOGY OF KNOWLEDGE — COGNITIVE ANTHROPOLOGY (5).** Pr., SY 201 or COI. An interdisciplinary approach to the understanding of human knowledge emphasizing cognitive anthropology and sociology of knowledge. Credit for this course precludes credit for SY 410.

ADVANCED UNDERGRADUATE AND GRADUATE

- 511. **LANGUAGE AND CULTURE (5).** The social basis of verbal communication; functions of language in society; importance of language in contemporary social problems.
- 512. **GENERAL ETHNOLOGY (5).** Surveys ethnological data from several societies in order to provide an understanding of the range and variability of cultural phenomena.
- 524. **SPECIAL TOPICS IN ANTHROPOLOGY (1-5).** Pr., ANT 203 or COI. Examines selected topics from an anthropological perspective. May be repeated for a maximum of 10 hours
- 532. **INDIANS OF NORTH AMERICA (5).** Aboriginal cultures of North America. Effects of culture contact. Contemporary problems of Indian communities.
- 550. **DIRECTED READING (1-5).** Pr., COI and junior standing. An independent reading program, under supervision, to provide for the pursuit of specific interests in anthropology not covered by other course offerings. Can be repeated for a maximum of 10 hours credit.
- 612. **SPECIAL TOPICS IN ETHNOLOGY (5).** Pr., COI. An intensive study of peoples and cultures from a particular geographical area of cultural adaptation.

Social Work (SW)

- 252. **SOCIAL WORK COLLOQUIUM (2).** Orientation to the social work field and the human service professions. Explores the nature of undergraduate social work education and careers resulting from this type of instruction.
- 320. **SOCIAL WORK FIELD PRACTICUM (1-5).** Pr., 252 or COI. An introduction to the fields, methods, and settings of social work practice through an internship in a selected social work setting. This course stresses a basic understanding of social service organizations. Students work under the joint supervision of the placement agency and the university. A seminar is held regularly to evaluate, discuss and interpret the student's work. May be repeated for a maximum of 5 hours credit.
- 375. **INTRODUCTION TO SOCIAL WELFARE (5).** Pr., sophomore standing. The development of U.S. social welfare programs, policies, and services. Emphasizes political, economic, and social factors involved. Introduction to health and welfare services of local community.
- 376. **COMMUNITY SOCIAL SERVICES (3).** A review of the social services available in a typical community including: public assistance; medical service for the indigent; protective services; adoption; mental health; child care; family planning; employment training, etc. Emphasis upon the substance of services and the organizational character and administrative problems of social services.
- 380. **FOUNDATIONS OF SOCIAL WORK (5).** Pr., SY 201. The integration of social science perspectives for the social work student. Surveys interpretations of biological, socio-psychological, and cultural determinants of behavior for social work practice.

426. **SPECIAL TOPICS IN SOCIAL WORK (1-5).** Pr., SY 201 or COI, junior standing. Examines selected topics from a social work perspective. May be repeated for a maximum of 10 hours credit.

ADVANCED UNDERGRADUATE AND GRADUATE

506. **SOCIAL WORK METHODS I (5).** Pr., SW 375, SW 380 and admission to social work program or COI. The first in a sequence of social work practice method courses focusing on the application of knowledge value and skill in carrying out a problem-solving, systems oriented approach with clients at the individual, small group, organization and community level. Emphasis on application of research, process of social change, non-judgmental practitioner stance and regard for cultural, racial, age and lifestyle variations.
507. **SOCIAL WORK METHODS II (5).** Pr., SW 506. Continuation of SW 506.
508. **SOCIAL WORK METHODS III (3).** Pr., SW 507. Continuation of SW 507.
512. **AGING ISSUES AND SERVICES (2-5).** Pr., SY 201, SW 375, or COI. Reviews social services and social work with elderly, and issues in economics, religion, health, mental health, politics, mass media education, biology, housing, nutrition, and recreation. Field work option.
520. **SOCIAL WORK FIELD PLACEMENT (1-15).** Pr., SW 508, and COI. A planned field experience in which the student is placed in a community service agency, working under the joint supervision of the agency and the University. A seminar is held regularly to evaluate, discuss, and interpret the student's work.
575. **SOCIAL WELFARE POLICY (5).** Pr., SW 375 or COI. Current problems, policy issues, and proposals in selected social welfare programs are critically examined and evaluated.

Speech Communication (SC)

Professors Bradley, Head, Barker, Richardson, Steinfatt, and Weidner

Associate Professors Overstreet, Phillips, Smith, and Solomon

Assistant Professors Clatterbuck, Freeman, Hand, Haynes, Sanders, and Weaver

Instructors Arnold, Ray, and Sweeney

a. Communication Theory/Rhetoric and Public Address

200. **INTRODUCTION TO UNDERGRADUATE STUDY IN SPEECH COMMUNICATION (5).** Acquaints the prospective speech major or minor with the fundamentals of speech, the historical, psychological, sociological, and other bases of speech.
202. **APPLIED SPEECH COMMUNICATION (3).** To improve the effectiveness of the human communication in one's daily life. Explores interviewing and oral reporting, and involves experiments with speech communication variables.
203. **VOICE AND ARTICULATION (3).** Provides a body of knowledge about voice production and articulation (articulation, pronunciation, and intonation) for persons interested in knowing what the productive act of speaking is about and applying this knowledge to the improvement of their own speech.
204. **INTRODUCTION TO PUBLIC RELATIONS (5).** The broad spectrum of the field of public relations. The various communication skills and technologies necessary for successful public relations will be identified and explored. Credit for this course precludes credit for JM 204.
211. **PUBLIC SPEAKING (5).** Content, organization, style, delivery, adaptation to the audience, ethics, and criticism. Theory and practice, composition and delivery of original speeches.
273. **GROUP PROBLEM SOLVING THROUGH DISCUSSION (5).** Group problem solving through discussion. The values and limitations of discussion, the prerequisites of reaching agreement, and a systematic approach to solving problems in group discussion. Leadership in problem solving.
275. **DEBATE WORKSHOP (1).** Introduction to the national debate question for beginning debaters interested in competition debate. Lecture and practical work. May be repeated for a maximum of 3 credit hours.
301. **SPEECH COMMUNICATION THEORIES (5).** The nature, purposes, and process of oral communication. Theories of language, goals of various forms of oral communication are considered. Deviations from normal speech and special problems in communication are explored.
326. **INTERPERSONAL COMMUNICATION (5).** An analysis and comparison of several approaches to the study of current problems in interpersonal behavior and relational communication. Topics will include: contexts of varying person perception; interpersonal attraction, and how person perception is related to behavior.
371. **PARLIAMENTARY PROCEDURE (1).** To aid the individual who may lead or participate in discussions of organizations where orderly procedure is needed. Theory and practice both employed.
375. **DEBATE WORKSHOP (1).** Advanced national debate question for experienced debaters. Analysis of logical, emotional proofs in competition debate. Lecture and practical work. May be repeated for a maximum of 3 credit hours.
378. **ARGUMENTATION AND DEBATE (5).** Debating techniques and procedures; their application to issues of current public interest; the gathering, organization, and presentation of facts, proofs, evidence.

Note: All 500 level courses in the various areas of Speech Communication are Advanced Undergraduate and Graduate.

501. **PSYCHOLOGY OF COMMUNICATION (5).** Pr., one course in psychology. Speech as a psychological phenomenon with consideration of language development, symbolism, verbal learning, Small groups and audience behavior and psychological studies in various areas of communication situations.
503. **NONVERBAL COMMUNICATION (5).** Research and theory in several areas of non-verbal communication including kinesics, proxemics, paralinguistics, environment, and personal appearance.
504. **PUBLIC RELATIONS CASE STUDIES AND PROBLEM SOLVING (5).** Pr., SC 204, or JM 204, or COI. Investigation and analysis of public relations problems through case studies, and an application of necessary skills and techniques in solving public relations problems. Credit for this course precludes credit for JM 504.
505. **SURVEY RESEARCH METHODS IN MASS COMMUNICATION (5).** Theory and practical experience in methods of survey research in mass media and public relations. Sampling techniques, interview strategies, questionnaire development, and data analysis.
506. **SPECIAL TOPICS IN SPEECH COMMUNICATION (1-5).** Examines selected topics in Speech Communication. May be repeated; only 5 hours applicable to the major.
509. **SOCIAL DIALECTS (5).** Investigates origin and nature of different dialects of American English. Focuses on the characteristics and causes of social dialects and the problems encountered in our society because of their existence. Particular emphasis will be placed on social dialects in Alabama.
510. **COMMUNICATION STRATEGIES OF SOCIAL MOVEMENTS (5).** An examination of the communication techniques of contemporary social movements to attract members, solidify support and effect social change. Topics to be covered include: stages of development of movements; issues, persuasive strategies and stylistic devices of representative groups; and, nature and impact of social movements.
511. **PERSUASIVE SPEAKING (5).** Pr., SC 211 or COI. Understanding, practicing, and analyzing persuasion. Survey of alternative theoretical approaches to attitude formation and change. Practical experience in organizing and presenting persuasive messages. Developing skills as a critical evaluator of persuasion in natural settings.
512. **COMPUTER APPLICATIONS TO COMMUNICATION THEORY AND RESEARCH (5).** Applies computer simulation techniques to the process of message construction, diffusion of information, small group interaction and organizational network analyses. Course also utilizes statistical packages in the testing of the communication dependent hypotheses.
578. **DIRECTING FORENSICS (5).** An examination of the various philosophies of forensic programs. Representative forensic situations; leading theorists.

GRADUATE

601. **INTRODUCTION TO GRADUATE STUDY IN SPEECH COMMUNICATION (1).** Explanation of graduate school requirements and procedures; introduction to professional associations; study of relevant style manuals; development of a research prospectus.
602. **MEASUREMENT IN COMMUNICATION RESEARCH (5).** Response measurement techniques and their application to behavioral research in communication. Particular attention to attitudinal and electrophysiological phenomena.
- 603-604. **DEVELOPMENT OF RHETORICAL THEORY I, II (5-5).** Pr., COI. Advanced studies in the historical development of writings, men, and movements. Materials selected from the periods: A. Ancient and Medieval; B. Renaissance and Modern.
606. **SEMINAR: STUDIES IN COMMUNICATION THEORY (5).** Contemporary theories and analysis of concepts, models and pertinent research in interpersonal communication. Consideration of selected topics.
607. **INDEPENDENT STUDY (1-5).** Prior written approval required. Conferences, readings, research, and reports in one of the listed categories. May be repeated for a maximum of 5 hours credit.
608. **SEMINAR IN PERSUASION AND ATTITUDE CHANGE (5).** A critical examination of current theory and research in the area of the persuasive act and its effects. Particular attention to current departmental projects as examples of present research.
610. **SEMINAR IN INSTRUCTIONAL COMMUNICATION (5).** Critical analysis of teaching and research issues involving communication in the classroom. Processes associated with the impact of communication on learning.
611. **BRITISH PUBLIC ADDRESS (5).** Pr., COI. An analysis of the speakers and issues representative of the period 1600-1840 in Great Britain, including the foundations of British public address.
612. **EXPERIMENTAL METHODS IN COMMUNICATION (5).** A survey and analysis of experimental and empirical research in communication with emphasis on experimental designs.
613. **AMERICAN PUBLIC ADDRESS I (5).** Criticism of selected speakers, and speeches, 1750-1860, studied against a background of political, social, and intellectual issues.
614. **AMERICAN PUBLIC ADDRESS II (5).** Criticism of selected speeches and speakers, 1860 to present, studied against a background of political, social, and intellectual issues.
615. **RHETORICAL CRITICISM (5).** Pr., COI. The history and method of rhetorical criticism. Application of critical standards to selected men and their work.

- 626. **INTERPERSONAL COMMUNICATION THEORY (5).** Theory and research in the process and effects of interpersonal communication.
- 672. **SEMINAR IN SMALL GROUP COMMUNICATION (5).** Principles of human communication as they apply to the small group setting. Processes associated with group decision-making.
- 673. **SEMINAR IN GROUP AND ORGANIZATIONAL COMMUNICATION (5).** Group decision-making within an organizational setting. How groups effect change within functioning organizations. Processes associated with the diffusion of innovations.
- 678. **SEMINAR IN ARGUMENTATION AND DEBATE (5).** Systems of argumentation as inquiry and advocacy; studies of debate as a decision making procedure; representative argumentation theorists and leading practitioners.
- 698. **SEMINAR IN SPEECH COMMUNICATION (5).** Advanced treatment of contemporary topics and trends as well as current research findings and opportunities. May be repeated for credit with change in topics.
- 699. **THESIS. (CREDIT TO BE ARRANGED.)**

b. Interpretation

- 320. **FUNDAMENTALS OF ORAL INTERPRETATION OF LITERATURE (5).** Oral readings of prose, poetry and drama, enhancing the student's understanding and appreciation of the art of literature by engaging him actively in reading the literary text aloud.
- 521. **ORAL INTERPRETATION OF PROSE (5).** Pr., SC 320 or COI. Develops skill in the oral reading of creative prose. Theories concerning the sound, sense, and performance of prose.
- 522. **ORAL INTERPRETATION OF POETRY (5).** Pr., SC 320 or COI. Theories concerning problems in reading verse, criticism and performance; modes of group performance are included.
- 523. **READERS THEATER (5).** Pr., SC 320 or COI. Investigates literature appropriate to group performance and treats the techniques of adaptation, compilation, rehearsal and staging of non-dramatic literature.

GRADUATE

- 620. **DEVELOPMENT AND THEORY OF INTERPRETATION (5).** The growth and change of theories regarding oral interpretation.

c. Mass Communication

- 230. **INTRODUCTION TO BROADCASTING (5).** The history, growth, and development of broadcast communications and the legal, social, and political aspects of broadcasting.
- 235. **MODES OF FILM COMMUNICATION (5).** The film industry's contribution to television and other forms of mass communication; an analysis of the styles and forms of film production as entertainment, communication, education and art.
- 334. **BROADCAST PRODUCTION TECHNIQUES—RADIO (5).** Pr., COI. Analysis of the creative efforts and responsibilities in the primary stages of broadcast production. Practice in writing, producing, directing, performing, and crewing radio productions and taped material.
- 335. **CINEMA AND SOCIETY (5).** Pr., SC 235 or COI. The role of film, its history, contributions and effectiveness as an area of expression and communication; an analysis of the social, artistic, economic and cultural factors which have influenced the film.
- 336. **TELEVISION PRODUCTION—DIRECTION I (5).** Pr., COI. Individual and group projects in the development and production of programs and formats; and intense study of directing theory and the director's role through presentation of educational and dramatic materials.
- 337. **FILM PRODUCTION I (5).** Pr., SC 235 or COI. Theory and principles of film making. Special instruction given through practical application of silent film to the problems of production planning, writing, direction, cinematography, and editing.
- 338. **BROADCAST NEWS WRITING (5).** Pr., COI. Writing and editing news and informational materials for television and radio. Students solicit and prepare news from and for local sources.
- 431-432. **MASS COMMUNICATION WORKSHOP (3-3).** Pr., SC 230, 235, 336, and departmental approval. Experience as a part-time staff member with an approved local station or production company.
- 531. **THE SOCIAL INFLUENCE OF MASS COMMUNICATION (5).** Functions and effects of mass communication on contemporary social norms and values. The impact of the media on the level of violence and aggressive behavior, the nature of the political process; and individual attitudes and behavior.
- 534. **RADIO PRODUCTION TECHNIQUES II (5).** Pr., SC 234 or COI. A continuation of SC 234 with further refining of writing, producing, directing, performing and crewing radio productions and audio taped material.
- 536. **TELEVISION PRODUCTION—DIRECTION II (5).** Pr., SC 336. Individual and group projects in the creation of program material with special emphasis on the writer-producer and his role in the industry.

537. **TELEVISION PRODUCTION III (5).** Pr., SC 336 and 536 or COI. Individual and group projects in the writing and producing of television programs with an emphasis on preparation of graphics, lighting and on-camera talent.
538. **TELEVISION—RADIO—FILM WRITING (5).** Pr., COI. The technique of writing dramatic and non-dramatic material for television, radio, and films. Special emphasis is placed on performance. Students may elect to emphasize one area.
539. **INTERNSHIP (6).** Pr., departmental permission and junior standing. S-U grading only.

GRADUATE

630. **STUDIES IN MASS COMMUNICATION (5).** Pr., COI. Combined media and their relationship with speech and communication.
631. **DEVELOPMENT OF AMERICAN BROADCASTING (5).** Pr., COI. The origin of radio and television broadcasting and its development to the present day.
632. **BROADCAST PROGRAMMING AND CRITICISM (5).** Pr., COI. The theory and practice of programming, its problems and concepts, coupled with an analysis of the criticism leveled at the process and the product.
633. **BROADCAST REGULATIONS (5).** The social and political control of broadcasting by agencies, groups, and organizations through legal, social, and economic means.

d. Speech Pathology and Audiology

(Speech Pathology)

340. **THE SPEECH AND HEARING MECHANISM (5).** Anatomy and physiology of the speech and hearing mechanism.
341. **PHONETICS (3).** LEC. 2, LAB. 3. Principles of phonetics and their application to speech.
350. **INTRODUCTION TO SPEECH PATHOLOGY—AUDIOLOGY (5).** Survey of the field of speech pathology-audiology. Includes history of the profession, the inter-relatedness of the various pathologies, general principles of evaluation and therapy, and the profession itself.
455. **INTRODUCTION TO CLINICAL PROCEDURES IN SPEECH PATHOLOGY (1).** Pr., SC 551 or 552 or equivalent. Orientation to clinical activities in the area of Speech Pathology. Clinical observation required.
456. **CLINICAL INSTRUMENTATION AND TEST PROCEDURES (1).** Pr., SC 455 or equivalent. Orientation to diagnostic and therapy instrumentation and procedures. Clinical observation required.
457. **THERAPEUTIC PROCEDURES IN SPEECH PATHOLOGY (2).** Pr., SC 456, 553, or 554 or equivalent. Introduction to therapeutic methods and program writing. Clinical practice in speech therapy procedures required.
458. **ADVANCED THERAPEUTIC PROCEDURES IN SPEECH PATHOLOGY (2).** Pr., SC 457, 553, and SC 554 or equivalent. Orientation and an introduction to supervised clinical activity in the area of speech disorders. Clinical practice required. May be repeated for credit.
459. **CLINICAL SPEECH PRACTICUM IN THE PUBLIC SCHOOLS FOR EDUCATION MAJORS (1).** Pr., SC 458. Orientation and an introduction to supervised clinical activity in the area of public school speech and language disorders. Clinical practice required. May be repeated twice for credit.
550. **PRINCIPLES OF SPEECH CORRECTION (5).** Not open to students emphasizing or majoring in speech correction and audiology. Basic principles underlying a speech correction program in a school setting. Description and discussion of speech disorders; surveys and identification techniques.
551. **ARTICULATION DISORDERS (5).** Pr., SC 340, 341, or equivalent. Introduction to the principles of normal and deviant articulation acquisition.
552. **NORMAL AND DEVIANT LANGUAGE ACQUISITION IN CHILDREN (5).** Pr., SC 340, 341, or equivalent. Introduction to the principles of normal and deviant language acquisition.
553. **FLUENCY DISORDERS (5).** Pr., SC 340, 341, or equivalent. Introduction to the principles of fluent and dysfluent verbal behavior.
554. **VOCAL DISORDERS (5).** Pr., SC 340, 341. Introduction to the principles of normal and deviant vocal behavior.
555. **NORMAL ASPECTS OF HUMAN VERBAL COMMUNICATION (5).** Pr., SC 340, 341, junior standing. Introduction to the normal processes of speech, language and hearing including: the physiological aspects of normal human speech communication, the hemispheric processing of language, the acoustical aspects of speech production and transmission, the psychoacoustic aspects of speech reception and the perceptual variables associated with linguistic behavior.
556. **COMMUNICATION DISORDERS IN THE AGING (4).**

GRADUATE

650. **CLINICAL PROBLEMS IN SPEECH (1).** Pr., SC 455-458 series or COI. Methods, techniques, and clinical management of the disorders of speech. Clinical practice required. May be repeated for credit.

651. **ARTICULATION DISORDERS (4).** Pr., SC 551 or COI. Empirical and theoretical bases for articulatory pathologies, diagnoses, and therapies.
652. **ASSESSMENT STRATEGIES IN CHILD LANGUAGE DISORDERS (4).** Pr., SC 552 or COI. Empirical and theoretical bases for evaluation of language-disordered children.
653. **FLUENCY DISORDERS (4).** Pr., SC 553 or COI. Empirical and theoretical bases for dysfluency disorders, diagnoses, and therapies.
654. **VOICE DISORDERS (4).** Pr., SC 554 or COI. Empirical and theoretical bases for voice pathologies, diagnoses, and therapies.
655. **LANGUAGE AND SPEECH DISORDERS IN ADULTS (4).** Pr., SC 552 or COI. Empirical and theoretical bases for speech/language disorders associated with CNS pathologies, diagnoses, and therapies.
656. **CLEFT PALATE (4).** Pr., SC 551 or COI. Empirical and theoretical bases for speech/language pathologies associated with cleft palate, diagnoses, and therapies.
657. **SEMINAR IN SPEECH PATHOLOGY. (CREDIT TO BE ARRANGED.)** Pr., SC 551, 552, 553, 554, or COI. Advanced treatment of contemporary topics and trends, as well as current research aspects of speech pathology. May be repeated for credit with change in topics.
658. **FIELD EXPERIENCE IN SPEECH PATHOLOGY (5-10).** S-U grading only. Full-time assignment in a speech and hearing facility, the choice being made from the following settings: University Speech and Hearing Clinic, hospital, public school, and various community agencies serving speech- and hearing-impaired children and adults. May be repeated for a maximum of 10 hours credit. No more than 5 hours may be used for minimum requirements toward a master's degree.
659. **THE NEUROLOGICAL BASES OF COMMUNICATIVE DISORDERS (4).** Pr., graduate standing. Auditory and physiology of the central nervous system as it relates to Speech, Language and Hearing functions and disorders.
662. **TREATMENT STRATEGIES IN CHILD LANGUAGE DISORDERS (4).**

(Audiology)

465. **INTRODUCTION TO CLINICAL PROCEDURES IN AUDIOLOGY (1).** Pr., SC 560 or equivalent. Audiological instrumentation and test procedures. Clinical observation in audiological procedures required.
466. **AUDIOLOGICAL EVALUATION PROCEDURES (2).** Pr., 465 and 561 or equivalent. Procedures in audiometric evaluations. Clinical practice in audiological procedures required.
467. **ADVANCED AUDIOLOGICAL EVALUATION PROCEDURES (2).** Pr., SC 466 and 562 or equivalent. Procedures in hearing evaluations, hearing aid evaluations, and aural rehabilitation. May be repeated for credit.
560. **INTRODUCTION TO AUDIOLOGY (5).** Principles of auditory reception, the hearing mechanism and the problems involved in measuring, evaluating, and conserving hearing. Clinical observation.
561. **HEARING PATHOLOGY (5).** Pr., SC 560 or equivalent. Evaluation and rehabilitation of aural handicapped children and adults; hearing aids and hearing training. Clinical practice.
562. **HEARING EVALUATION, REHABILITATION AND CONSERVATION (5).** Pr., SC 561 or COI. Detailed concern for the rehabilitation problems of children and adults in the area of auditory training, speech reading and speech conservation. Clinical practice.

GRADUATE

660. **CLINICAL PROBLEMS IN HEARING (1).** Pr., SC 465, 466, 560, 561, and 562, or COI. May be repeated for credit.
661. **PEDIATRIC AUDIOLOGY (4).** Pr., SC 560, 561, 562, or COI. Etiologic factors, screening, audiologic assessment, differential diagnosis, and clinical management of infants and children with hearing disorders.
662. **ADVANCED CLINICAL AUDIOLOGY I (4).** Pr., SC 560, 561, 562, or COI. Audiometric calibration, instrumentation, and physical requirements for audiometry. Introduction to advanced audiometric techniques, with an emphasis on evaluation of the peripheral auditory system.
663. **ADVANCED CLINICAL AUDIOLOGY II (4).** Pr., SC 560, 561, 562, or COI. Continuation of SC 662. Advanced techniques in differential diagnosis of auditory function emphasizing assessment of pseudohypoacusis, the central auditory system and the use of physiologic methods.
664. **AURAL REHABILITATION (4).** Pr., SC 560, 561, 562, or COI. Clinical and therapeutic management of persons with hearing disorders, including selection and use of individual and group amplifying systems and electro-acoustic measurement of hearing aid performance.
665. **INDUSTRIAL AUDIOLOGY (4).** Pr., SC 560 or COI. Measurement and control of environmental noise; industrial audiometry, medico-legal aspects, and conservation of hearing.
666. **PHYSIOLOGICAL ACOUSTICS (4).** Pr., SC 560, 561, 562, or COI. Review of the layout of the auditory pathways, instrumentation, psychoacoustics and electrophysiology of the auditory system, as well as literature related to normal audition.
667. **SEMINAR IN AUDIOLOGY. (CREDIT TO BE ARRANGED.)** Pr., SC 560, 561, 562, or COI. Advanced treatment of contemporary topics and trends, as well as current research aspects of audiology. May be repeated for credit with change in topics.

668. **FIELD EXPERIENCE IN AUDIOLOGY (5-10).** S-U grading only. Full-time assignment in a speech and hearing facility, the choice being made from the following settings: University Speech and Hearing Clinic, hospital, public school, and various community agencies serving speech- and hearing-impaired children and adults. May be repeated for a maximum of 10 hours credit. No more than 5 hours may be used for minimum requirements toward a master's degree.
669. **ADVANCED CLINICAL AUDIOLOGY III (4).** Rationale and procedures for evaluation of central auditory nervous system, including interpretation of test results.
680. **EXPERIMENTAL PHONETICS (4).** Pr., SC 341 or equivalent. Orientation to acoustic and physiologic instrumentation used in the study of normal and disordered speech.
690. **AUDITORY MANAGEMENT OF HEARING-IMPAIRED CHILDREN (4).** Familiarizes audiologists with the parameters involved in the management of hearing-impaired school aged children.
691. **VISUAL COMMUNICATION FOR THE HEARING-IMPAIRED (4).** Familiarizes audiologists with the various methods available for communicating visually with the hearing impaired.

Technical Services (TS)

Associate Professors Blakney and Goolsby

Assistant Professors Clement, *Acting Head*, Conner, McMurtry, and Wingard

Instructors Goff, Leach, and Conrad

100. **INTRODUCTION TO MANUFACTURING PROCESSES (2).** LEC. 1, LAB. 2. Laboratory oriented studies in economic production principles related to metal and plastic product manufacturing.
102. **GRAPHICAL COMMUNICATION & DESIGN (2).** LAB. 6. Graphical technique and projective geometry relating to spatial visualization and communication in design.
104. **DESCRIPTIVE GEOMETRY (2).** LAB. 6. Pr., TS 102. Basic principles pertaining to point, line and plane, including development problems.
105. **ENGINEERING DRAWING II (2).** LAB. 6. Pr., TS 102. Advanced phases of graphical techniques and conventions including technical sketching.
107. **GRAPHICAL ANALYSIS AND DESIGN (2).** LAB. 6. Pr., TS 102. Application of orthographic projection principles in solving engineering problems.
108. **DESIGN FOR MANAGEMENT (2).** LAB. 6. Pr., TS 102, 107 or equivalent. Fundamental graphical concepts relative to management activities including design and communication.
111. **WOODWORKING (1).** LAB. 3. Introduction to machines, tools, and materials used in working with wood.
112. **WELDING SCIENCE AND APPLICATION (1).** LAB. 3. Basic principles and application of welding and cutting processes in the fabrication of metals.
113. **MACHINE TOOL LABORATORY (1).** LAB. 3. Introduction to metal removal processes; basic machines of production.
114. **SHEET METAL DESIGN AND FABRICATIONS (1).** LAB. 3. Methods and equipment used in design, production and fabricating of sheet metal products.
115. **FOUNDRY TECHNOLOGY (1).** LAB. 3. Basic fundamentals involved in casting products of ferrous and non-ferrous metals.
204. **KINEMATICS OF MACHINES (3).** LEC. 2, LAB. 3. Pr., TS 104, 105 and PS 220. Spring. Graphical analysis of machine elements including velocity diagrams.
216. **PLASTICS TECHNOLOGY (2).** LEC. 1, LAB. 2. Pr., TS 100 or equivalent. Laboratory oriented course in material and processes of plastic products.
307. **GENERAL METALS (5).** LEC. 3, LAB. 4. Pr., COI. Design, construction and finishing art metal projects.
308. **GAGES AND MEASUREMENTS (5).** LEC. 4, LAB. 2. The science of measurement as applied to production and inspection of industrial products.
402. **ADVANCED WOODWORKING (5).** LEC. 3, LAB. 4. Pr., TS 111. Design, construction, and finishing fine objects of wood.
405. **PROBLEMS IN WELDING ENGINEERING (5).** LEC. 3, LAB. 4. Pr., TS 112. Advanced phases and techniques of welding and allied processes. Problems in design, weldability of metals, inspection practice, and selection of equipment.
406. **PROBLEMS IN MACHINING (5).** LEC. 3, LAB. 4. Pr., TS 113. Advanced phases of metal machining with emphasis on production machines and accessories.

ADVANCED UNDERGRADUATE AND GRADUATE

515. **SHOP WORK FOR ELEMENTARY TEACHERS (5).** LEC. 2, LAB. 6. Methods, materials, and techniques involved in conducting activity programs in schools and recreational centers.
516. **MATERIALS OF INDUSTRIAL ARTS (5).** LEC. 5. Pr., senior standing. History and use of various materials used in industry.

517. **ORGANIZATION OF SHOP COURSES (5). LEC. 5.** Pr., senior standing. Organization and administration of the Industrial Arts program in the public schools.
518. **INDUSTRIAL ARTS DESIGN (5).** Pr., senior standing. Fundamentals of design as applied to Industrial Arts programs.
550. **ENGINEERING METROLOGY (1-5).** Pr., departmental approval. Design, construction, and use of precision measuring equipment and gages.

GRADUATE

- 611-612. **TECHNICAL PROBLEMS IN INDUSTRIAL ARTS (5-5).** Pr., graduate standing. Advanced study of technology and methods in selected areas of Industrial Education.

Textile Engineering (TE)

Professors Lynch, Head, Hall, and Waters
Associate Professors Broughton, Perkins, and Walker
Assistant Professors Gupta and Whitley

Basic Textiles

101. **INTRODUCTION TO TEXTILES (3).** An introduction to the textile industry. The industry, its products, business and manufacturing structures, careers and education programs.
141. **TEXTILE CHEMISTRY (5). LEC. 4, LAB. 2.** Pr., TE 101. The discipline of science is presented to assist the student in making the transition from secondary to post secondary study of the physical sciences. Production and modification of textile products with chemistry.
211. **YARN FORMING SYSTEMS (5). LEC. 4, LAB 2.** Pr., TE 101. Forming of staple and filament yarns. Interactions between raw materials and manufacturing systems that create specified product characteristics.
221. **FABRIC FORMING SYSTEMS (5). LEC. 4, LAB 2.** Pr., TE 101. The basic forming systems for textile fabrics including knit, woven and non-woven structures.
231. **TEXTILE FIBERS I (5). LEC. 4, LAB 2.** Pr., TE 141. Natural and man-made fibers, their production, structure and properties. The relationship between polymeric fibrous materials, end products and utilization.

Intermediate Textiles

241. **DYEING AND FINISHING OF TEXTILE MATERIALS (5). LEC. 4, LAB 2.** Pr., TE 141, CH 104. Emphasis on principles and techniques to modify textile materials by coloration, additives and surface treatment. The chemistry of these phenomena is studied.
212. **SPECIAL TOPICS ON YARN MANUFACTURING (4). LEC. 3, LAB. 2.** Pr., all Basic Textile Courses. An extension of TE 211. Mechanics of yarns, geometry and properties of yarns as influenced by processing techniques. Both conventional and non-conventional processes are explored.
213. **PREPARATION OF YARNS FOR FABRIC FORMING (2). LEC. 2.** Pr., all Basic Textile Courses. Yarn packaging and sizing for further processing; chemistry of sizing materials; management aspects of yarn preparation and effects on yarn properties and process efficiency are covered.
222. **WOVEN STRUCTURES (3). LEC. 2, LAB 2.** Pr., all Basic Textile Courses. Looms and loom mechanisms are covered including cam, dobb, jacquard and shuttleless machines. The principles of operation, process efficiency and fabric quality are emphasized. Constraints of each system are included.
232. **TEXTILE FIBERS II (5). LEC. 4, LAB. 2.** Pr., all Basic Textile Courses. An extension of Textile Fibers I. Provides an in-depth analysis of physical and chemical structure and resulting properties of textile fibers. Application of fiber theory to practical manufacturing situations.
242. **CHEMICAL TECHNOLOGY OF BLEACHING, DYEING AND FINISHING (3). LEC. 2, LAB. 2.** Pr., all Basic Textile Courses. TE 241. Bleaching, dyeing and finishing of fabrics made from natural and man-made fibers: dyes and pigments for textiles, their chemical structure and utility.
311. **TEXTURIZED YARNS (2).** Pr., all Basic Textile Courses. Methods and principles of science applied to the modification of continuous multifilament textile yarns to alter their characteristics. Preparation of textured and non-textured yarns is presented.
321. **KNIT STRUCTURES (3). LEC. 2, LAB 2.** Pr., all Basic Textile Courses. Principles involved in the formation of knit structures. The scope of capability-design and mechanical constraints, quality and relation between input materials and product characteristics is included.
322. **NON CONVENTIONAL FABRIC STRUCTURES (3).** Pr., all Basic Textile Courses. Methods of fabric forming other than conventional weaving or knitting are surveyed. More emphasis is placed on specific methods of greater economic significance.
342. **ANALYTICAL INSTRUMENTATION IN TEXTILES (3). LEC. 2, LAB 2.** Pr., all Basic Textile Courses. TE 241. Use of specialized analytical instrumentation to assist in the production of textile products; as means to solve problems of color mixing, waste water characterization, dust measurement and the identification of materials. Systems control by instrumentation is also included.

ADVANCED UNDERGRADUATE TEXTILES

- 325. DESIGN OF TEXTILE FABRICS (4). LEC. 2, LAB. 4.** Pr., all Intermediate Textile Courses. Technical fabric design drafts for woven and knit structures are studied. Patterns are developed on production machines. Problems of cost, material and people utilization as influenced by product design are presented.
- 350. TESTING OF TEXTILE MATERIALS (5). LEC. 3, LAB. 4.** Pr., all Intermediate Textile Courses. Basic principles of measuring the physical and chemical properties of natural and man-made textile materials; includes supplementary laboratory experiments.
- 351. ANALYSIS OF TEXTILE FABRIC STRUCTURES (5). LEC. 3, LAB. 4.** Pr., all Intermediate Textile Courses, TE 325. Analysis of textile fabrics, including woven, knit and non-conventional structures formed from the interlacings of primary materials. The student will make a technical, economic and manufacturing plan for the production of such materials.
- 352. TEXTILE QUALITY CONTROL (3).** Pr., IE 220, TE 350. The practical application of quality control in the textile industry with emphasis on statistical control techniques. Areas covered include measures of variation, statistical quality control charts, sample size, confidence interval, significance testing, correlation, and analysis of variance.
- 380. TEXTILE COSTING (5).** Pr., all Intermediate Textile Courses, TE 325, ACF 215. Application of accounting principles in the determination of product cost and profit analysis. The making of managerial decisions related to product mix, material utilization, and the allocation of resources to the manufacturing of textile products.
- 421. JACQUARD WEAVING AND DESIGN (2). LEC. 1, LAB. 2.** Pr., all Intermediate Textile Courses. Jacquard mechanism and design of original patterns for jacquard loom.
- 441. APPLIED DYEING THEORY (5). LEC. 4, LAB. 2.** Pr., all Intermediate Textile Courses. Dye film bonding; thermodynamics and kinetics of dyeing.
- 480-481. PLANT DESIGN, OPERATION AND CONTROL I & II (4). LEC. 4, AND (4). LEC. 3, LAB. 2.** Pr., TE 490 (TE 480), TE 491, (TE 481). A two quarter sequence in planning, operation and control of a textile manufacturing plant. Includes the problem of plant changeover, changing product mix, technical requirements, constraints, use of resources, plant location and design, changing markets and emerging technology.
- 482. TEXTILE MANAGEMENT (3).** Pr., all Intermediate Textile Courses. A practical business management approach to the analysis and solution of problems in the textile industry. The major areas of concern to management are discussed, including policy determination, organization structure and analysis, employment function, manpower development, financing purchasing, production, merchandising, industrial and public relations.
- 490-491. UNDERGRADUATE RESEARCH I, II, (5), (5).** Pr., Inter, Textiles, TE 351, 352. A two quarter sequence in undergraduate research.

Theatre (TH)

Professors Angotti, *Head*, and Harrison
Associate Professor Miller
Assistant Professors Evans, Garren and Powel
Instructor Acampora

- 100. THEATRE CONVOCATION (0).** Required of all declared theatre majors during every quarter of residency. Workshops, critiques, performances, lectures, and discussions by faculty, students and visiting artists and scholars.
- 101. INTRODUCTION TO THE THEATRE (3).** Appreciation of theatre arts including stage, television and film. Development of sensitivity and critical sophistication as articulate, discriminating theatregoers. Play and film viewing, play reading, critiques and term projects.
- 211. ACTING: FUNDAMENTALS (4).** Develops ability to respond to imaginative situations with sincerity, individuality and effectiveness; projects in elementary stage technique exercises to aid the student to develop awareness of his/her expressive mechanism and creative imagination through improvisation.
- 212. ACTING: TECHNIQUES (4).** Pr., 211 or COI. Exploration of basic performance techniques utilizing improvisation and theatre games; emotional and sensory recall, and elementary script analysis through open scenes and written play texts.
- 215. STAGE VOICE (2).** Theory and techniques of speaking voice production for the stage.
- 231. THEATRE TECHNOLOGY I (4).** Principles and practice in the planning, drafting of work drawings, construction, painting, rigging, and shifting of stage scenery. Practical experience.
- 232. THEATRE TECHNOLOGY II (4).** Principles and practice of stage lighting technology, stage sound technology and the construction of hand, set, and dress properties for the stage.
- 233. DRAFTING FOR THE THEATRE (4).** Pr., 231 or COI. A comprehensive study of the techniques and methods used in the graphic representation of stage scenery and properties.

240. **THEATRICAL DESIGN (4).** The elements of design used in the creation of theatrical space. Exploration of the fundamental visual design elements and materials with experimentation in their application to theatrical design. Practical utilization of design theory in various visual and theatrical design projects.
261. **COSTUME CONSTRUCTION (4).** The basic steps used in costume construction for the theatre from patterns through final ornamentation. Practical experience.
265. **STAGE MAKEUP (3).** Basic principles and practice of stage makeup and makeup design including facial painting and techniques of prosthesis.
271. **PLAY ANALYSIS (4).** Pr., 101 or COI. How to read a play with an examination of traditional and non-traditional scripts of various periods and genres.
281. **THEATRE PRODUCTION I (4-8).** Pr., Consent of the department; offered summers only. Intensive study of theatre arts through participation in the AU Summer Repertory Theatre.
282. **SUMMER REPERTORY THEATRE COMPANY I (6-12).** Pr., Consent of the department; offered summers only. A concentrated workshop experience in all aspects of theatre production through participation in rehearsal and performance.
300. **THEATRE LABORATORY (1-4).** Required of all theatre majors during every quarter of residency; a minimum of 9 hrs. required for graduation. Practice in various areas of arts and crafts of theatre, including construction and painting of scenery and properties, stage operation, lighting, sound, costuming, makeup, publicity, and business management.
305. **CREATIVE DRAMATICS (3).** Leadership principles in creative dramatics; story materials and their adaptation to children's needs; techniques for planning, guiding, and evaluating improvised drama; emphasis on creative dramatics as a teaching/learning tool in the classroom.
306. **CHILDREN'S THEATRE (3).** Theatre for children, involving an examination of play scripts, acting, and production techniques.
310. **ACTING: PRACTICUM (1-4).** Open to students cast in Auburn University Theatre productions.
311. **ACTING: CHARACTERIZATION (4).** Pr., 212 or COI. Theory and technique of character analysis, development and the process of creating a role through the study of all characters in a significant modern play text.
312. **ACTING: SCENE STUDY (4).** Pr., 311 or COI. Advanced characterization study and application, including rehearsal and performance of roles from selected scenes before an invited audience.
321. **DIRECTING: FUNDAMENTALS (4).** Pr., 211, 271 or COI. Theories and techniques of stage direction; analysis of plays; preparation of production plans; practice in stage direction, including open casting and production of at least two scenes before an invited audience.
322. **DIRECTING: ADVANCED (4).** Pr., 321 or COI. Advanced theories and techniques of stage direction; problems of dealing with actors, characterization and style; production of selected scenes and/or one-act play before an invited audience.
331. **ADVANCED THEATRE TECHNOLOGY (4).** Pr., 231 or COI. Practical application of new materials and techniques in the theatre, including plastics, metals, and other non-traditional products.
332. **STAGE CARPENTRY TECHNIQUES (4).** Pr., 231 or COI. Methods and techniques employed in construction and rigging of stage scenery and properties, including both the traditional and non-traditional methods and solutions used in scenic construction.
333. **SCENE PAINTING (4).** Pr., 240 or COI. Practical techniques and skills for executing the scenic/visual elements of theatrical designs, including traditional painting styles and non-traditional materials and methods.
341. **SCENE DESIGN I (4).** Pr., 240 or COI. Theory and practice of designing and executing scenery for the stage. Emphasis on traditional styles and methods. Fundamentals of presenting the design idea in perspective rendering and model form.
342. **SCENE DESIGN II (4).** Pr., 341 or COI. Advanced theory and practice in the use of scenery and light for the theatrical event. Emphasis on experimental and non-traditional design for a variety of theatre spaces.
345. **RENDERING FOR THE THEATRICAL DESIGNER (4).** Pr., 240 or COI. Exploration of traditional drawing and rendering techniques to facilitate designer communication in scenic, lighting and costume design. Exercises in handling a variety of artistic media.
351. **LIGHTING DESIGN (4).** Pr., 232, 240 or COI. Principles and practice of stage lighting both as a design and technical medium. Practical production experience in lighting traditional and experimental theatre spaces.
361. **COSTUME HISTORY I (4).** The history of costume from ancient Egypt through 1750.
362. **COSTUME HISTORY II (4).** The history of costume from 1750 to the present.
365. **COSTUME DESIGN I (4).** Pr., 240, 361, 362 or COI. Principles and practice of costume design with emphasis on designing and rendering costumes from various historical periods.
366. **COSTUME DESIGN II (4).** Pr., 365 or COI. Advanced principles and practice of costume design with emphasis on designing and rendering costumes utilizing new and/or non-traditional approaches.
371. **HISTORY OF THE THEATRE I (4).** Social, religious, political, and artistic forces that have contributed to the development of theatre and drama in western civilization from its origins through the Italian Renaissance.

372. **HISTORY OF THE THEATRE II (4).** Social, religious, political, and artistic forces that have contributed to the development of theatre and drama in western civilization from the Elizabethan Age to the middle of the nineteenth century.
373. **HISTORY OF THE THEATRE III (4).** Social, religious, political, and artistic forces that have contributed to the development of modern European theatre and drama from 1860 to 1960.
400. **PROFESSIONAL INTERNSHIP (1-12).** Pr., Completion of core program in BFA theatre major and permission of the department. Internship with professional or community theatres in the student's general field of specialization (1 hr. credit for each 30 hrs. work).
405. **THEATRE OPERATIONS/MANAGEMENT (4).** Theory and practice of theatre management and arts administration.
409. **THEATRE OPERATIONS/MANAGEMENT: SPECIAL PROJECTS (2-4).** Pr., COI. Selected projects in theatre management and arts administration.
411. **ACTING: CLASSIC PERIODS (4).** Pr., 312 or COI. Exploration of acting problems in the performance of dramatic works from various pre-modern theatrical periods, styles and genres; rehearsal and performance of roles from selected scenes before an invited audience.
412. **ACTING: MIXED GENRES (4).** Pr., 312 or COI. Exploration of acting problems in the performance of dramatic works of a non-traditional nature, including modern avant-garde and contemporary experimentation; rehearsal and performance of roles from selected scenes before an invited audience.
413. **ACTING: AUDITIONS (4).** Pr., 312, senior standing, and COI. The theories, techniques and realities of auditions: preparation of 5-10 pieces with presentation of at least 4-5 selected pieces before an invited audience.
419. **ACTING: SPECIAL PROJECTS (2-4).** Pr., COI; repeatable to a maximum of 8 hrs. Selected advanced projects or recitals for public theatre production.
421. **DIRECTING: PERIODS (4).** Pr., 322 or COI. Advanced theories and techniques of stage direction relating to problems of verse and period dramatic literature; production of selected scenes before an invited audience.
429. **DIRECTING: SPECIAL PROJECTS (2-4).** Pr., or COI; repeatable to a maximum of 8 hrs. Direction of a long one-act or full length play for public performance.
439. **THEATRE TECHNOLOGY: SPECIAL PROJECTS (2-4).** Pr., COI; repeatable to a maximum of 8 hrs. Selected projects in theatre technology and/or technical direction executed before a public audience.
441. **HISTORY OF DESIGN IN THE THEATRE (4).** A survey of design elements, including architecture, as practiced in the significant movements in theatre history from the time of the ancient Greeks to the present.
449. **SCENE DESIGN: SPECIAL PROJECTS (2-4).** Pr., COI; repeatable to a maximum of 8 hrs. Selected projects in scenic design executed before a public audience.
459. **LIGHTING DESIGN: SPECIAL PROJECTS (2-4).** Pr., COI; repeatable to a maximum of 8 hrs. Selected projects in lighting design executed before a public audience.
461. **ADVANCE COSTUME CONSTRUCTION I (4).** Pr., 261 or COI. The study of pattern drafting and draping and their relationship to a costumer's craft.
462. **ADVANCED COSTUME CONSTRUCTION II (4).** Pr., 261 or COI. The principles and execution of tailoring period and modern clothes for the stage and the utilization of a costumer's related crafts chosen from macrame, knitting, fabric painting, basic millinery, jewelry construction and cobbling.
469. **COSTUME DESIGN: SPECIAL PROJECTS (2-4).** Pr., COI; repeatable to a maximum of 8 hrs. Selected projects in costume and/or makeup design executed before a public audience.
471. **AMERICAN THEATRE HISTORY (4).** A survey of American theatre and drama from the beginnings to the present.
472. **CONTEMPORARY THEATRE (4).** A survey of international contemporary theatre movements and drama of the past quarter century.
475. **DRAMATIC THEORY AND CRITICISM (4).** A survey and analysis of selected writings on the structure and aesthetic values of both the drama and the theatre.
481. **THEATRE PRODUCTION II (4-8).** Pr., 281 and consent of the department; offered summers only. Advanced problem solving in theatre production with emphasis upon individual assignment to positions in the repertory theatre.
482. **SUMMER REPERTORY THEATRE COMPANY II (6-12).** Pr., 282 and consent of the department; offered summers only. An intensive experience in all aspects of theatre production. The advanced student may focus on the development of professional artistic skills.
491. **INDEPENDENT STUDY (1-4).** Pr., COI and the department head. Repeatable to a maximum of 16 hrs. Directed reading and tutorial projects of interest to the advanced student.
498. **THEATRE SEMINAR: (various titles to be assigned) (1-8).** Pr., COI; repeatable to a maximum of 16 hrs. Intensive study of special theatre topics falling outside the regular theatre offerings. Individual topics announced prior to offering of the course.

Veterinary Medicine (VM)**Anatomy and Histology**

Professors Holloway, *Head*, and Krista
 Associate Professors Buxton and Gray
 Assistant Professors Reynolds, Rumph, Garrett, Ireland, and Brown

Microbiology

Professors Smith, *Head*, Rossi, Schnurrenberger, and Shultz
 Associate Professors Attleberger, Swango, and Wilt
 Assistant Professors Giambrone, Lawman, and Panangala
 Adjunct Associate Professors Christenberry and Klesius
 Adjunct Instructors Brown, Coker, and Stringfellow

Pathology and Parasitology

Professors Benz, Groth, Moore, Morgan, Mitchell, and Powers
 Associate Professors Diamond, Hoff, Teer, Miller, Spano, and Kwapien
 Assistant Professor Crawley
 Adjunct Professors Bailey, Baker, and Lindsey
 Adjunct Associate Professors Ernst and Frandsen
 Adjunct Assistant Professor Hoerr
 Instructors Hanrahan, Rhyan, Smith, and Newton
 Adjunct Instructor D'Andrea

Physiology and Pharmacology

Professors Clark, *Head*, Redding, Beckett, Burns, and Ganjam
 Associate Professor Robertson
 Assistant Professors Branch and Pedersoli

Radiology

Professor Bartels, *Head*
 Assistant Professor Pechman
 Instructors Brawner and Hathcock
 Adjunct Assistant Professor Lo

Large Animal Surgery and Medicine

Professors Walker, *Head*, Hudson, and Wiggins
 Adjunct Professor Montes
 Associate Professors Hoover, Humburg, Purohit, and Winkler
 Assistant Professors Brown, Carson, B. Hudson, Jones, Powe, Sharman, and Stone
 Instructors McClary and Woolf
 Adjunct Associate Professor Kjar
 Resident Linda S. Hammond

Small Animal Surgery and Medicine

Professors Knecht, *Head*, Hanks, Hoerlein, Horne, and Redding
 Associate Professors Albert, Braund, Milton and Swaim
 Assistant Professors August, Dillon Henderson, Luttgen, MacDonald, Mansfield,
 Pidgeon, Sorjonen, and Wiggins
 Instructor Whitley
 Adjunct Professor Hughston
 Resident Veterinary Surgeons King and Goldstein
 Resident Internal Medicine Katherman

Veterinary Medicine (VM)

Following this section of Veterinary Medicine Course Descriptions, the remaining VM courses are listed under their alphabetically arranged departments.

300. **ORIENTATION (2).** Fall. Dynamics of professional responsibilities, duties and privileges of the veterinarian.
313. **PHYSIOLOGY I (4).** LEC. 4. Fall. Cell physiology and respiratory physiology.
- 313L. **PHYSIOLOGY LABORATORY I (1).** LAB. 2. Fall. Experiments on cell physiology and reproductive physiology.
314. **PHYSIOLOGY II (2).** LEC. 2. Pr., VM 313-313L. Fall. Reproductive physiology.
315. **PHYSIOLOGY III (2).** LEC. 2. Pr., VM 314. Winter. Gastrointestinal and liver physiology.
- 315L. **PHYSIOLOGY LABORATORY II (1).** LAB. 2. Winter. Experiments on the endocrine and digestive systems.
316. **PHYSIOLOGY IV (3).** LEC. 3. Pr., 314-315L. Winter. Endocrinology.
317. **PHYSIOLOGY V (3).** LEC. 2, LAB. 2. Pr., 315-315L. Winter. Blood and electrocardiology.
318. **PHYSIOLOGY VI (4).** LEC. 4. Spring. Cardiovascular and renal physiology.
- 318L. **PHYSIOLOGY LAB. III (1).** LAB. 2. Spring. Physiology and Pharmacology experiments on the cardiovascular system and the kidney.
319. **PHARMACOLOGY I (2).** LEC. 2. Pr., VM 318. Spring. Introductory pharmacology.
- 320-321-322. **ANATOMY I, II, III (5-5-5).** LEC. 2, LAB. 10. Fall, Winter, Spring. Gross anatomy of domestic animals. A comparative study of the gross structures of the dog, cat, ox, horse, hog, fowl, laboratory animals, and zoo animals.
326. **MICROSCOPIC ANATOMY I (5).** LEC. 2, LAB. 6. Fall. Microscopic anatomy of the form, structure, and characteristics of the basic tissues of animals.
327. **MICROSCOPIC ANATOMY II (5).** LEC. 2, LAB. 6. Pr., VM 326. Winter. Microscopic anatomy of the tissue, composition of organs and organ systems.
328. **MICROSCOPIC ANATOMY III (4).** LEC. 2, LAB. 4. Pr., VM 327. Spring. Microscopic anatomy of the reproductive organs. Formation and early development of the embryos of domestic animals. Fetal membranes and placentation are emphasized.
331. **VETERINARY MICROBIOLOGY I (4).** LEC. 3, LAB. 2. Spring. Veterinary Immunology for students in Veterinary Medicine.
401. **PHARMACOLOGY II (3).** LEC. 2, LAB. 2. Pr., VM 319. Fall. Pharmacology of general anesthetics.
402. **PHARMACOLOGY III (4).** LEC. 3, LAB. 2. Pr., VM 401. Winter. Systematic pharmacology.
403. **PHYSIOLOGY VII (4).** LEC. 3, LAB. 2. Pr., VM 318-319. Fall. Neurology, respiratory physiology and the pharmacodynamics of drugs affecting the central nervous system.
404. **PHYSIOLOGY VIII (3).** LEC. 2, LAB. 2. Pr., VM 403. Winter. Neurology, and the pharmacodynamics of drugs affecting the central nervous system and radiobiology.
405. **PATHOLOGY I (6).** LEC. 4, LAB. 4. Pr., VM 322 and 328. Fall. Disease processes affecting animals with emphasis on the gross and microscopic changes in cells, tissue organs, and systems.
406. **PATHOLOGY II (5).** LEC. 3, LAB. 4. Pr., VM 405. Winter. Continuation of VM 405.
407. **PATHOLOGY III (4).** LEC. 3, LAB. 2. Pr., VM 406. Spring. Continuation of VM 406.
408. **LABORATORY ANIMAL MEDICINE (3).** LEC. 2, LAB. 2. Pr., VM 405 and 406. Spring. Management, utilization, and disease of the common laboratory mammals including rats, mice, guinea pigs, hamsters, rabbits, and nonhuman primates.
409. **VETERINARY PARASITOLOGY I (4).** LEC. 3, LAB. 2. Fall. Introduction to parasitology including internal and external parasites of domestic animals.
410. **VETERINARY PARASITOLOGY II (5).** LEC. 4, LAB. 2. Pr., VM 409. Winter. Continuation of VM 409.
411. **VETERINARY MICROBIOLOGY II (4).** LEC. 2, LAB. 4. Pr., VM 331. Fall. Bacteriology and Mycology of Veterinary Pathogens.
412. **VETERINARY MICROBIOLOGY III (5).** LEC. 3, LAB. 4. Pr., VM 331 and 411. Winter. Veterinary Virology. Rickettsiology and chlamydia are considered briefly.
413. **PREVENTIVE MEDICINE (4).** LEC. 4. Spring. Principles of epidemiology, preventive medicine, and environmental health, selected diseases of animals transmissible to men and the relationship of the veterinarian to public health and animal disease control agencies.
414. **VETERINARY MEDICINE I (5).** LEC. 5. Spring. Detailed etiology, symptoms, pathogenesis, diagnosis, treatment, and prevention of the medical diseases affecting the various systems and organs of the equine, bovine, ovine and porcine species.

420. **VETERINARY MEDICINE II (5). LEC. 5.** Fall. Continuation of VM 414 and includes nutritional deficiency diseases.
421. **VETERINARY SURGERY I (3). LEC. 3.** Fall. Background of surgery; major surgical injuries—wounds, fluid loss and infection; preoperative and postoperative care; surgical techniques; anesthesia.
422. **VETERINARY SURGERY II (3). LEC. 3.** Winter. Special surgical diseases of the domestic farm animals including surgery of the alimentary canal, the chest and abdomen, the respiratory and cardiovascular systems, the eye and ear, the genito-urinary tract, and the feet and limbs.
423. **CLINICAL PATHOLOGY (5). LEC. 5.** Pr., VM 407. Spring. Methods for the collection, preservation and examination of various body fluids including blood and urine. Interpretation of results is directed toward clinical diagnosis and prognosis.
424. **VETERINARY MEDICINE & SURGERY I (6).** Fall. The diagnostics, medical and surgical treatment of small animals.
425. **VETERINARY MEDICINE & SURGERY II (5).** Pr., VM 424. Winter. Continuation of VM 424.
426. **VETERINARY SURGERY III (1). LAB. 2.** Pr., VM 424. Fall. Introductory laboratory on basic surgical asepsis, anesthesia, and techniques.
427. **VETERINARY MEDICINE & SURGERY III (3). LEC. 3.** Pr., VM 424-425. Fall. The systemic diseases and clinical immunologic procedures in small domestic animals.
428. **PHYSICAL DIAGNOSIS (LAC) (2). LEC. 1, LAB. 2.** Fall. Demonstration and application of principles and techniques of physical diagnosis of large animals.
429. **PHYSICAL DIAGNOSIS (SAC) (1). LAB. 2.** Fall. Demonstration and practice of handling, restraint, physical diagnosis, and administration of therapeutic agents related to small animals.
430. **VETERINARY JURISPRUDENCE AND ETHICS (2).** Winter. Laws relating to the veterinary profession. Professional ethics for the veterinarian.
431. **VETERINARY RADIOLOGY (4). LEC. 4.** Fall. Basic diagnostic radiology including interpretations, techniques, therapy and equipment.
432. **VETERINARY MYCOLOGY (2). LEC. 1, LAB. 2.** Pr., VM 411. Winter. Mycology of veterinary pathogens.
434. **APPLIED ANATOMY (2). LAB. 4.** Spring. Anatomy related to diagnostic, obstetrical and surgical procedures.
435. **THERIOGEOLOGY (5). LEC. 5.** Spring. Clinical application of the physiology of reproduction, causes and correction of dystocia, genital examinations, and infertility of the male and female.
436. **SPECIAL ANATOMY (1-5). (HOURS AND CREDIT TO BE ARRANGED.)** Pr., VM 320. Elective course in which any phase of anatomy of domestic animals to the anticipated field on specialization may be studied.
437. **VETERINARY MEDICINE III (5).** Summer. Identification and study of selected poisonous plants of the U.S. and common chemical and venom poisoning of farm animals and pets. To include characteristic signs, lesions, methods of diagnosis, and treatment.
- 438-439. **VETERINARY MEDICINE IV, V (4-5).** Winter, Fall. Principal infectious diseases of large domestic animals. Epizootiology, etiology, clinical signs, diagnosis and diseases control including immunization and sanitation.
- 440-441-442-443. **CLINICS VII, VIII, IX, X (6-6-6-6).** Spring, Summer, Fall, Winter. Conferences, laboratory exercises, and practice in diagnosis, control, and therapy of diseases of small domestic animals.
- 444-445-446-447. **CLINICS AND LARGE ANIMAL SURGERY AND THERIOGEOLOGICAL EXERCISES II, III, IV, V (7-7-7-7). LAB. (12-18-17-18).** Spring, Summer, Fall, Winter. Conferences, laboratory exercises, and practice in diagnosis, control, and therapy of diseases and surgical procedures for large domestic animals.
448. **VETERINARY SURGERY III (2). LAB. 4.** Fall. Introductory and detailed consideration and performance of small animal surgery.
449. **VETERINARY SURGERY IV (2). LAB. 4.** Pr., VM 428 & 448. Winter. Detailed consideration and performance of small animal surgery.
451. **VETERINARY PUBLIC HEALTH II (2). LEC. 2.** Pr., VM 411. Winter. Principles and methodology of food hygiene including meat, milk, poultry, and other foods related to animal and human health.
452. **VETERINARY PUBLIC HEALTH III (2). LEC. 2.** Pr., VM 451. Winter. A continuation of VM 451.
453. **SEMINAR (2).** Each quarter. Literature reviews or research problems selected by the student. Papers written and oral presentation given before his class and faculty.
454. **PRECEPTORSHIP (0). NON-CREDIT REQUIRED COURSE.** Spring. Completion of satisfactory preceptorship during the spring quarter is required for graduation.
460. **INTRODUCTORY CLINICS (1-2). LAB. 4.** Introduction to the clinical practice of large and/or small animal medicine.

Anatomy and Histology (VAH)

ADVANCED UNDERGRADUATE AND GRADUATE

- 520-521-522. ANATOMY I, II, III (5-5-5). LEC. 2, LAB. 10.** Pr., COI. Fall, Winter, Spring. Gross anatomy of domestic animals. A comparative study of the gross structures of the dog, cat, horse, hog, fowl, laboratory animals and zoo animals.
- 526. MICROSCOPIC ANATOMY I (5). LEC. 2, LAB. 6.** Pr., COI. Fall. Microscopic anatomy of the form, structure, and characteristics of the basic tissues of animals.
- 527. MICROSCOPIC ANATOMY II (5). LEC. 2, LAB. 6.** Pr., COI. Winter. Microscopic anatomy of the tissue composition of organs and organ systems.
- 528. MICROSCOPIC ANATOMY III (4). LEC. 2, LAB. 4.** Pr., COI. Spring. Microscopic anatomy of the reproductive organs. Formation and early development of the embryos of domestic animals. Fetal membranes and placentation are emphasized.
- 570. HISTOLOGICAL TECHNIQUES (2-5).** Pr., COI. Quarter by arrangement. Detailed techniques employed in the preparation of cytological histological materials.

GRADUATE

- 621. CARDIOVASCULAR ANATOMY (5). LEC. 2, LAB. 9.** Pr., COI. Quarter by arrangement. Structure of the cardiovascular system. Comparative developmental, and gerontologic phases emphasized.
- 622. A COMPARATIVE STUDY OF THE UROGENITAL SYSTEM IN ANIMALS (5). LEC. 2, LAB. 9.** Pr., COI. Quarter by arrangement. Structure of the urinary and genital systems.
- 623. NEUROANATOMY (5). LEC. 2, LAB. 9.** Pr., COI. Quarter by arrangement. Structure of the central and peripheral nervous systems.
- 624. EXPERIMENTAL NEUROANATOMY (5). LEC. 2, LAB. 9.** Pr., COI. Quarter by arrangement. Use of the Horsley-Clark stereotaxic instrument and other experimental neuroanatomical procedures.
- 625. ANATOMY OF THE LOCOMOTOR SYSTEM (5). LEC. 2, LAB. 9.** Pr., COI. Quarter by arrangement. Dissection of the structures of the locomotor system. The horse is utilized as the primary model.
- 626. ANATOMY OF THE SPECIAL SENSES (5). LEC. 2, LAB. 9.** Pr., COI. Quarter by arrangement. Taste, smell, sight, and hearing. Macroscopic and microscopic specimens are utilized to correlate structure and function.
- 627. ADVANCED HISTOLOGY OF DOMESTIC ANIMALS (5). LEC. 2, LAB. 6.** Pr., COI. Quarter by arrangement. The basic tissues. The light microscope and electron micrographs are utilized to interpret morphology.
- 628. ADVANCED ORGANOLOGY OF DOMESTIC ANIMALS (5). LEC. 2, LAB. 6.** Pr., COI. Quarter by arrangement. Organs and organ systems, utilizing the light microscope and electron micrographs to interpret morphology.
- 696. SEMINAR (1). QUARTER BY ARRANGEMENT.** Required of all graduate students who major in Veterinary Anatomy and Histology.
- 698. RESEARCH PROBLEMS (2 TO 5). QUARTER AND CREDIT BY ARRANGEMENT.**
- 699. RESEARCH AND THESIS. CREDIT TO BE ARRANGED.**
- 799. RESEARCH AND DISSERTATION. CREDIT TO BE ARRANGED.**

Large Animal Surgery and Medicine (VLA)

GRADUATE

- 651-2-3. ADVANCED LARGE ANIMAL SURGERY (5-5-5). LEC. 1, LAB. 8.** Any quarter by arrangement. Research in surgery. Advanced techniques for surgical procedures in the domestic animals.
- 654-655. ADVANCED LARGE ANIMAL MEDICINE (5-5). LEC. 1, LAB. 8.** Any quarter by arrangement. The causes, methods of diagnosis, treatment and methods of control and education of selected non-surgical diseases of domestic animals.
- 657. GYNECOLOGY OF LARGE DOMESTIC ANIMALS (5).** Any quarter by appointment. Functional and infectious conditions affecting female reproduction.
- 658. ANDROLOGY OF LARGE DOMESTIC ANIMALS (5).** Any quarter by arrangement. Functional and infectious conditions affecting breeding sires.
- 659. ADVANCED VETERINARY ANESTHESIOLOGY (5). LEC. 3, LAB. 4.** Pr., COI and Graduate Standing. Summer. Advanced anesthetic principles and uses of various anesthetic agents in veterinary medicine with emphasis on clinical monitoring of physiological parameters and intensive care of critical patients.
- 660. HEALTH MAINTENANCE OF FOOD ANIMALS (5). LEC. 5.** Pr., Graduate Standing and COI. Any Quarter by Arrangement. Advanced principles of health maintenance of food and fiber animals emphasizing sustenance of the health state rather than the employment of restorative or preventive medicine.

661. **RECONSTRUCTIVE SURGERY (5). LEC. 2, LAB. 6.** Fall. Even years. Techniques in reconstructive surgery in small and large animals.
696. **SEMINAR (1). REQUIRED OF ALL GRADUATE STUDENTS IN LARGE ANIMAL SURGERY AND MEDICINE.** Meets at scheduled intervals each year.
698. **RESEARCH PROBLEMS (2-5). CREDIT TO BE ARRANGED.**
699. **RESEARCH AND THESIS. CREDIT TO BE ARRANGED.**
799. **RESEARCH AND DISSERTATION. CREDIT TO BE ARRANGED.**

Microbiology (VMI)

GRADUATE

501. **VETERINARY MICROBIOLOGY II (6). LEC. 3, LAB. 6.** COI. Fall. Bacteriology and Mycology of Veterinary Pathogens.
502. **VETERINARY MICROBIOLOGY III (5). LEC. 3, LAB. 4.** COI. Winter. Animal viruses, pathogenesis of viral diseases, viral oncology and host responses to viral infections and tumors. Chlamydia and rickettsia are considered briefly.
503. **VETERINARY PUBLIC HEALTH (4). LEC. 3, LAB. 2.** COI. Spring. Principles of epidemiology, selected diseases of animals transmissible to men and the relationship of the veterinarian to public health and animal disease control agencies.
536. **TISSUE CULTURE TECHNIQUES AND APPLIED VIROLOGY (3). LEC. 1, LAB. 6.** Pr., COI, and junior standing. Fall. Fundamentals of mammalian tissue and cell culture with respect to the importance of water quality, media and buffers, glassware, plasticware; procedures of washing and sterilizing labware and equipment; techniques of primary tissue culture and the culture of continuous cell lines; and methods for the study of virus in cell cultures.
601. **DETERMINATIVE VETERINARY BACTERIOLOGY (5). LEC. 3, LAB. 4.** COI. Quarter by arrangement. Identification, classification, nomenclature, distribution and systematic relationship of bacteria of veterinary significance. The historical background, literature of bacterial taxonomy and rules of nomenclature will be considered.
602. **BACTERIAL PATHOGENESIS (5). LEC. 5.** COI. Quarter by arrangement. How bacteria cause disease. The cellular and subcellular basis for bacterial pathogenesis. Study of bacterial toxins, host bacteria interaction, mixed bacterial and bacterial-viral infections.
604. **IMMUNOBIOLOGY (5). LEC. 5.** COI. Quarter by arrangement. The biologic basis of the immune response: immunocompetent cells. Various types of immune responses. Hypersensitivities, blood and tissue antigens, histocompatibility and immunogenetics.
605. **IMMUNOLOGY OF INFECTIOUS DISEASES (5). LEC. 5.** COI. Summer and Fall. The immune mechanism to selected models of human and animal infectious diseases.
606. **BOVINE VIROLOGY (5). LEC. 3, LAB. 4.** COI. Bovine viruses and the diseases they produce. Laboratory work includes techniques of studying bovine viruses and evaluating the resistance of the bovine to viral diseases.
607. **PATHOGENESIS OF VIRUS DISEASES OF ANIMALS (5). LEC. 5.** COI. How animal viruses produce disease in their hosts. Various well-studied models are used to demonstrate current theories and knowledge of pathogenetic mechanisms of virus-induced neurological diseases, enteric diseases, respiratory diseases, immune complex diseases, and neoplastic diseases.
608. **ADVANCED EPIDEMIOLOGY (5). LEC. 2, LAB. 6.** COI. Quarter by arrangement. Advanced techniques in epidemiological investigation; their application to diseases of man and animals for control purpose.
609. **MEDICAL MYCOLOGY (5). LEC. 3, LAB. 4.** COI and acceptable courses in bacteriology. Quarter by arrangement. Methods and techniques used in isolating and propagating yeasts, molds, and actinomycetes pathogenic for animals. Laboratory diagnosis of fungus infections in animals.
612. **METHODS OF IMMUNOLOGY (3-5). LEC. 1, LAB. 8.** Fall, Even years. Pr., COI. Advanced technology in the areas of immunobiology, immunochemistry, and immunopathology are offered. The course requires the formulation of a hypothesis, a literature search, utilization of at least 3 different immunologic techniques to solve the problem, and writing a paper, in journal style, to report the results of the problem solving exercises.
613. **CLINICAL IMMUNOLOGY (3). LEC. 3.** Spring. Even years. Pr., COI. Basic Immunology, Histology and/or Introductory Pathology. This course will present current concepts in clinical immunology and immunopathology. Emphasis is placed on the diseases mediated by the immune response and the techniques required to diagnose immunologic disorders. The course is taught on a systems basis and is designed for individuals with a clinical background or interest.
696. **SEMINAR (1).** Quarter by arrangement. Required of all graduate students who major in Veterinary Microbiology.
698. **RESEARCH PROBLEMS (2-5). QUARTER AND CREDIT BY ARRANGEMENT.**
699. **RESEARCH AND THESIS. CREDIT TO BE ARRANGED.**
799. **RESEARCH AND DISSERTATION. CREDIT TO BE ARRANGED.**

Pathology and Parasitology (VPP)

ADVANCED UNDERGRADUATE AND GRADUATE

- 518. GENERAL PATHOLOGY (5). LEC. 3, LAB. 4.** Pr., Satisfactory courses in histology and physiology. Fall quarter. The fundamental alterations of disease, adapted for especially qualified graduate students. (Not available for candidates for M.S. in Vet. Med.)
- 567. GROSS PATHOLOGY* (2). Lab. 6.** Pr., VM 407, and COI. Any quarter by arrangement. Regular participation in the necropsy examinations under the supervision of senior staff members. Gives the graduate student experience in necropsy procedures and in diagnostic-interpretation of gross lesions.
- 575. SPECIAL TECHNIQUES IN HISTOPATHOLOGY* (3). LAB. 9.** Pr., VM 407, VAH 570. Any quarter by arrangement. Special stains and techniques of histochemistry employed in the preparation of materials for histopathologic study.

GRADUATE

- 601. PATHOLOGY (2-5). LEC. 2, LAB. 9.** Pr., D.V.M. degree or equivalent, COI. Any quarter by arrangement. May be taken more than 1 quarter for a maximum of 10 credits in M.S. program or 20 credits in Ph.D. program. Mechanisms of response in domestic animals to diseases, the description and recognition of lesions, and other topics to meet the particular needs of students.
- 605. DIAGNOSTIC PATHOLOGY* (2-5).** Any quarter by arrangement. Limited to graduate students and residents in pathology. The diagnosis of animal diseases using necropsy procedures and histopathologic examination of tissue sections. Work will be under the supervision of a senior pathologist.
- 606. SURGICAL PATHOLOGY* (1-3).** Any quarter by arrangement. Limited to graduate students and residents in pathology. The histopathologic diagnosis of surgical biopsy specimens. Work will be under the supervision of a senior pathologist.
- 610. PATHOLOGY OF NUTRITIONAL AND METABOLIC DISEASES (3). LEC. 2, LAB. 2.** Pr., D.V.M. degree or VM 518 or equivalent and COI. The pathogenesis, physiopathology, and morphologic pathology of nutritional and metabolic diseases of domestic and laboratory animals.
- 614. ONCOLOGY* (5). LEC. 1, LAB. 8.** Pr., VPP 575. Any quarter by arrangement. Gross and microscopic pathology of neoplasms of domestic animals.
- 618. HISTOCHEMISTRY (5). LEC. 2, LAB. 6.** Pr., CH 419, VPP 518, COI. Any quarter by arrangement. Evaluation and application of histochemical methods in the localization of cellular constituents.
- 622. COMPARATIVE NEUROPATHOLOGY (5). LEC. 2, LAB. 6.** Pr., D.V.M. degree or equivalent, VAH 623, VPH 633, and COI. Any quarter by arrangement. Principles of pathologic processes affecting the nervous system of animals.
- 626. EXOTIC DISEASES (5). LEC. 2, LAB. 6.** Pr., D.V.M. degree or equivalent, COI. Any quarter by arrangement. Principles of pathogenesis and disease pattern recognition in animal diseases not endemic in the U. S.
- 630. ANIMAL MODELS FOR BIOMEDICAL RESEARCH (5). LEC. 2, LAB. 6.** Pr., D.V.M. degree or equivalent and COI. Any quarter by arrangement. Principles of disease processes in domestic and laboratory animals for use as experimental models in biomedical research.
- 649. SLIDE SEMINAR* (1).** All quarters. Limited to graduate students and residents in pathology. Weekly slide conference to discuss current diagnostic material. Required participation by all graduate students and residents in pathology.
- 650. ADVANCED CLINICAL PATHOLOGY I* (5). LEC. 4.** Pr., VM 423 or equivalent. Spring quarter. A comprehensive evaluation of diseases altering the lymphohematopoietic system.
- 651. ADVANCED CLINICAL PATHOLOGY II* (5). LEC. 2, LAB. 3.** Pr., VM 423 or equivalent. Fall. The concepts relating modern laboratory investigations to disease pattern recognition.
- 654. CLINICAL ONCOLOGY* (5). LEC. 5.** Concepts useful in the diagnosis and treatment of neoplastic diseases.
- 670. VETERINARY PROTOZOOLOGY (5). LEC. 3, LAB. 4.** Pr., VM 410 or ZY 511, COI. Any quarter by arrangement. Pathogenesis, diagnosis, therapy, and other topics relating to selected diseases of veterinary importance caused by protozoan parasites.
- 674-675. VETERINARY HELMINTHOLOGY (5-5). LEC. 3, LAB. 4.** Pr., VM 410 or ZY 511 or equivalent. Any quarter by arrangement. Pathogenesis, diagnosis, therapy, and other topics relating to selected diseases of veterinary importance caused by helminth parasites.
- 678. PATHOLOGY OF PARASITIC DISEASES (5). LEC. 2, LAB. 6.** Pr., VPP 518, COI. Any quarter by arrangement. Gross and microscopic pathology of parasitic diseases of veterinary importance.
- 696. SEMINAR (1).** Required of all graduate students with a major in veterinary Pathology and Parasitology. Any quarter by arrangement.
- 698. RESEARCH PROBLEMS (2-5). CREDIT TO BE ARRANGED.**
- 699. RESEARCH AND THESIS. CREDIT TO BE ARRANGED.**
- 799. RESEARCH AND DISSERTATION. CREDIT TO BE ARRANGED.**

*Available only to students who hold the D.V.M.

Physiology and Pharmacology (VPH)

ADVANCED UNDERGRADUATE AND GRADUATE

- 513. **PHYSIOLOGY I (4).** LEC. 4. Fall. Cell physiology and respiratory physiology.
- 514. **PHYSIOLOGY II (2).** LEC. 2. Pr., VM 313-313L. Fall. Reproductive physiology.
- 515. **PHYSIOLOGY III. (2).** LEC. 2. Pr., VM 314. Winter. Gastrointestinal and liver physiology.
- 516. **PHYSIOLOGY IV (3).** LEC. 3. Pr., VM 315-315L. Winter. Endocrinology.
- 517. **PHYSIOLOGY V (3).** LEC. 2., LAB 2. Pr., VM 315-315L. Winter. Blood, electrocardiology.
- 518. **PHYSIOLOGY VI (4).** LEC. 4. Spring. Cardiovascular and renal physiology.
- 519. **PHARMACOLOGY I (2).** LEC. 2. Pr., VM 318. Spring. Introductory pharmacology.
- 521. **PHARMACOLOGY II (3).** LEC. 2, LAB. 2. Pr., VM 319. Fall. Pharmacology of general anesthetics.
- 522. **PHARMACOLOGY III (4).** LEC. 3, LAB. 2. Pr., VM 401. Winter. Systematic pharmacology.
- 523. **PHYSIOLOGY VII (4).** LEC. 3, LAB. 2. Pr., VM 318-319. Fall. Neurology, respiratory physiology and the pharmacodynamics of drugs affecting the central nervous system.
- 524. **PHYSIOLOGY VIII (3).** LEC. 2, LAB. 2. Pr., VM 403. Winter. Neurology, and the pharmacodynamics of drugs affecting the central nervous system and radiobiology.

GRADUATE

- 601. **MEDICAL PHYSIOLOGY I (5).** LEC. 4, LAB. 2. Pr., an acceptable course in physiology. Fall & Spring. Functional analysis of mammalian organ systems with special emphasis on myology, neurology, circulation and respiration. Laboratory exercises will make use of the physiograph to validate physiologic functions.
- 602. **MEDICAL PHYSIOLOGY II (5).** LEC. 4, LAB. 2. Pr., An acceptable course in physiology. Winter & Summer. A continuation of VPH 601 with special emphasis on digestive, excretory, endocrine and reproductive systems.
- 605. **RESPIRATORY PHYSIOLOGY (5).** Pr., PH 601. Summer. Respiratory physiology and the physiological aspects of aviation, space and deep sea diving.
- 610. **EXPERIMENTAL PHYSIOLOGICAL TECHNIQUES (5).** LEC. 3, LAB. 6. Pr., COI. Spring. Anesthetic and surgical techniques used in many research procedures. Not for veterinary students.
- 631. **ADVANCED RENAL AND HEPATIC PHYSIOLOGY (5).** LEC. 4, LAB. 3. Pr., VPH 602. Summer. The physiology of the liver and kidney and the effects that certain disease processes have on these organs.
- 632. **ADVANCED ENDOCRINOLOGY AND REPRODUCTION (5).** LEC. 4, LAB. 3. Pr., VPH 602. Fall. The endocrine and reproductive systems of domestic animals in both health and disease.
- 633. **ADVANCED NEUROLOGY (5).** LEC. 4, LAB. 3. Pr., VPH 601. Winter. The physiology of the mammalian nervous system. Considerable emphasis will be placed on the physiological explanation of abnormalities and the use of the electroencephalogram.
- 635. **VETERINARY PHARMACOLOGY I (5).** LEC. 4, LAB. 2. Pr., acceptable course in physiology or pharmacology. Spring. Principles and mechanisms of drug action; passage of drugs across biologic barriers; mechanisms of absorption, distribution, biotransformation, and their effects on neurohumoral transmission. Drugs affecting the autonomic nervous system and muscle relaxants will be discussed.
- 636. **VETERINARY PHARMACOLOGY II (5).** LEC. 4, LAB. 2. Pr., acceptable course in physiology or pharmacology. Fall. Drugs of veterinary interest acting on the central nervous system. Basic principles of general anesthesia, general anesthetic agents, neuroleptanalgesics, dissociative anesthesia, narcotics and tranquilizers.
- 637. **VETERINARY PHARMACOLOGY III (5).** LEC. 4, LAB. 2. Pr., acceptable course in physiology or pharmacology. Winter. Drugs of veterinary interest that are used on the cardiovascular, digestive, reproductive and urinary systems will be discussed. Antibacterial drugs, antiseptics, insecticides and anthelmintics will also be included.
- 638. **PHYSIOLOGY OF DIGESTION (5).** LEC. 5. Pr., VPH 602. Spring. Enzymatic and bacterial digestion as well as the motility of the gastrointestinal tract in farm animals.
- 639. **SMALL ANIMAL NUTRITION (5).** LEC. 4, LAB. 3. Any quarter by arrangement. Pr., COI and acceptable courses in physiology. Requirement of amino acids, fats, carbohydrates, minerals and vitamins for dogs, cats and other small animals. Nutritional antagonists and symptoms of nutritional deficiencies in the animals.
- 645. **CARDIOLOGY (5).** Pr., VPH 601. Fall. The physiology of the heart and advanced techniques used in electrocardiology.
- 696. **SEMINAR (1).** Required of all graduate students in this department.

*Available only to students who hold the D.V.M.

698. RESEARCH PROBLEMS (2-5). CREDIT TO BE ARRANGED.

699. RESEARCH AND THESIS. CREDIT TO BE ARRANGED.

799. DOCTORAL RESEARCH AND DISSERTATION. CREDIT TO BE ARRANGED.

Small Animal Surgery and Medicine (VSA)

ADVANCED UNDERGRADUATE AND GRADUATE

Candidates for a master's degree in the School of Veterinary Medicine may be required to pass a preliminary oral or written examination to demonstrate adequate knowledge in their chosen fields. They must meet the general requirements for admission into the Graduate School.

580. **RADIOLOGICAL TECHNIQUES (5). LEC. 3, LAB. 4.** By arrangement. Detailed radiographic techniques including assignments on basic radiation physics.

647. **CANINE NEUROSURGERY (5). LEC. 2, LAB. 6.** Pr., COI. Fall, odd years. By arrangement. The applied anatomy, physiology, physical and radiographic diagnosis, and surgical correction of lesions (especially those of traumatic origin) affecting the nervous system of the dog.

659. **ADVANCED VETERINARY ANESTHESIOLOGY (5). LEC. 3, LAB. 4.** Pr., COI and Graduate Standing. Summer, even years. Advanced anesthetic principles and uses of various anesthetic agents in veterinary medicine with emphasis on clinical monitoring of physiological parameters and intensive care of critical patients.

660. **ADVANCED SMALL ANIMAL SURGERY (5). LEC. 3, LAB. 6.** Spring. Techniques in general small animal surgery.

661. **RECONSTRUCTIVE SURGERY (5). LEC. 2, LAB. 6.** Fall, even years. Techniques in reconstructive surgery in small and large animals.

662. **ADVANCED SMALL ANIMAL ORTHOPEDIC SURGERY (5). LEC. 3, LAB. 6.** Summer by arrangement. New techniques in general orthopedic surgery.

663. **ADVANCED VETERINARY OPHTHALMOLOGY I. GENERAL OPHTHALMOLOGY (5). LEC. 3, LAB. 4.** Fall, by arrangement. Advanced general techniques of diagnosis, medication and surgical techniques necessary for veterinary ophthalmology.

664-665. **ADVANCED SMALL ANIMAL MEDICINE (5-5). LEC. 5.** Summer, Fall, by arrangement. The causes, methods of diagnosis, treatment and control of non-surgical diseases of small animals.

666. **ADVANCED CANINE NEUROLOGY (5). LEC. 3, LAB. 6.** By arrangement. The neurodiagnostics and non-surgical therapy of neurological disorder in small domestic animals.

667. **NORMAL RADIOLOGICAL ANATOMY (5). LEC. 4, LAB. 2.** By arrangement. The normal structure, size and position of the various organs as they appear on flat and contrast radiographs.

668. **ADVANCED RADIOLOGY (5). LEC. 1, LAB. 8.** Winter. Advanced radiographic techniques including fluoroscopy, uses of contrast mediums and the principles of image intensification and cineradiography.

669. **RADIOLOGICAL INTERPRETATIONS (5). LEC. 1, LAB. 8.** By arrangement. Radiological interpretation of pathological lesions of domestic animals.

671. **SMALL ANIMAL CARDIOVASCULAR SURGERY (5). LEC. 3, LAB. 6.** Summer, odd years. Application of accepted, as well as the recently developed techniques of cardiovascular surgery.

672. **ADVANCED VETERINARY OPHTHALMOLOGY II. INSTRUMENTATION (5). LEC. 2, LAB. 6.** By arrangement. Emphasis is placed on the use of advanced instrumentation necessary for the diagnosis and treatment of ocular disease.

673. **ADVANCED VETERINARY OPHTHALMOLOGY III. ADVANCED OPHTHALMIC MEDICINE (5). LEC. 5.** Pr., VSA 672. By arrangement. Ophthalmology with emphasis on diagnosis and treatment of ocular diseases.

674. **ADVANCED VETERINARY OPHTHALMOLOGY IV. ADVANCED OPHTHALMIC SURGICAL TECHNIQUE. (5). LEC. 2, LAB. 6.** Pr., VSA 673. Quarter by arrangement. Ophthalmology with emphasis on ophthalmic surgery.

696. **SEMINAR (1).** Required of all graduate students in Veterinary Medicine. Meets regularly at scheduled intervals each year during Summer Quarter.

698. RESEARCH PROBLEMS (2-5). CREDIT TO BE ARRANGED.

699. RESEARCH AND THESIS. CREDIT TO BE ARRANGED.

799. RESEARCH AND DISSERTATION. CREDIT TO BE ARRANGED.

Vocational and Adult Education (VED)

Professors Baker, Head, and Kurth
Associate Professors Frank, Iverson, and Sankovsky
Assistant Professors Andrews, Bond, Brown, Burgess, Davis, Drake,
Hale, Halverson, Hartzog, Hayes, Johndrow,
Miller, Morgan, Patterson, Pearson, Stewart, Terry,
Trussell, White, Williams, and Wilson
Instructors Abbott and Street

- 102. ORIENTATION FOR TRANSFER STUDENTS (1).** Helps transfers from other curricula and students pursuing the dual objectives program to understand teacher education and teaching as a profession.
- 104. ORIENTATION TO LABORATORY EXPERIENCES FOR TRANSFERS (1).**
- 200. TYPEWRITING I (3). LAB. 5.** Mastery of keyboard; techniques of machine operation; basic typewritten applications. For students with no previous training in typewriting. (Students with previous typewriting instruction not eligible for credit. Consult with VOA staff for placement.)
- 201. TYPEWRITING II* (3). LAB. 5. Pr., VED 200** or one year of high school typewriting. Emphasis on business letters, tabulation, reports.
- 202. TYPEWRITING III* (3). LAB. 5. Pr., VED 201.** Advanced typewritten communications with special problems and arrangement.
- 203. TYPEWRITING IV* (3). LAB. 5.** Statistical typewriting; composition at the typewriter; executive office projects.
- 205. TRANSCRIPTION FUNDAMENTALS (1). LAB. 2. Pr., VED 200 or COL.**
- 246. INSTRUCTIONAL DRAWING (3). LAB. 6.** Preparing for the shop laboratory, including making freehand and pictorial sketches and drawings, reading working drawings, blue prints, manufacturers guides, and lettering, use of instruments, dimensioning, making models, floor plans, bills for materials, writing specifications, and developing working plans.
- 310. SHORTHAND I* (5). Pr., VED 200 or equivalent.** Basic course in Gregg shorthand. Emphasis on recognition of principles; rapid reading of notes; dictation of new material.
- 311. SHORTHAND II* (5). Pr., VED 310.** Reinforcement of principles; speed building dictation; development of transcription skills.
- 312. SHORTHAND III* (5). Pr., VED 311.** Emphasis on dictation speed and mailable transcription.
- 419. TRANSCRIPTION (5). LEC. 5, LAB. 5. Pr., VED 312.** Emphasis on improved production rates. Continued development of dictation speed. Transcription of letters with special features.
- 301. MACHINE TRANSCRIPTION (1). LAB. 2. Pr., VED 202 or COL.** May be taken more than one quarter for specialization not to exceed three credits. Eighteen instructional and performance hours in the production of general business correspondence in mailable form from recorded dictation.
- 301A. MACHINE TRANSCRIPTION (1) LAB. 2. Pr., VED 301, 202 OR COL.** Eighteen instructional and performance hours in the production of legal papers in mailable form from recorded dictation.
- 301B. MACHINE TRANSCRIPTION (1). LAB. 2. Pr., VED 301, 202 or COL.** Eighteen instructional and performance hours in the production of medical papers in mailable form from recorded dictation.
- 305. RECORDS MANAGEMENT (3).** Basic procedures of filing, records storage and control. Practice in record keeping.
- 346. VOCATIONAL AND ADULT EDUCATION. LEC. 2, LAB. 2.** Principles and Practices (3). Principles of vocational education and their application in developing and operating preparatory and in-service programs.
- 352. NOMENCLATURE FOR HEALTH RELATED OCCUPATIONS (5).** Equips the student with the essential medical terminology for effective communication among the various members of the health team.
- 354. CAREERS IN HEALTH RELATED OCCUPATIONS (5).** Identification of role and function in health related occupations including the range of occupations that require minimum training as well as those that require University level education.
- 356. HEALTH DELIVERY SYSTEMS (5).** Contemporary and emerging patterns in delivering health services.
- 400. INTRODUCTION TO POWER MECHANICS (5). LEC. 2, LAB. 6.** Design and operational theories related to power machines. Internal combustion engines; power trains; hydraulic and cooling systems.

*The shorthand and typewriting sequence should be begun at the highest possible level because credit may be gained through advanced placement. With previous training in either, the student may enter the second, third, or fourth quarter course. If a grade of C or higher is earned, credit is given for the lower courses. If a C is not earned, advanced placement credit will not be granted. Consult with OA staff for placement.

401. **PRACTICUM IN SMALL GASOLINE ENGINES (5). LEC. 2, LAB. 6.** Application of skills and abilities needed in teaching the maintenance and repair of small air cooled engines. Theories of compression, carburetion and ignition; laboratory exercises in repair and maintenance.
402. **AUTOMOTIVE CONSTRUCTION AND REPAIR (5). LEC. 2, LAB. 6.** Theories of design, principles of operation, and maintenance and repair of ignition system, fuel systems, power systems and chassis components.
403. **PRINCIPLES OF ELECTRICITY (1). LAB. 3.** An introductory course in the principles and application of elementary laws governing electricity and its use.
404. **PRACTICUM IN GENERAL METALS (5). LEC. 2, LAB. 6.** Application of skills and abilities needed in the teaching of metal processes applicable to vocational education program in the secondary school. Metal properties; power tools; heat treating; ornamental iron work, cold metal, sheet metal; machining metals; and arc and gas welding.
405. **THE SCHOOL SHOP (3).** Organization and management of the school shop; methods and materials integrated with the study of jobs and problems basic to the teaching of skills in vocational education.
406. **PRACTICUM IN BUILDING CONSTRUCTION AND MAINTENANCE (5). LEC. 2, LAB. 6.** Application of skills and abilities needed in teaching the erections of buildings and other related structures.
407. **PRACTICUM IN ELECTRICITY (4). LEC. 2, LAB. 6.** Application of skills and abilities needed in the teaching of fundamental principles of electricity. Planning and developing projects involving an understanding of electrical principles as applied to materials selection, circuits, motors and devices; and maintenance and servicing of electrical equipment and appliances.
408. **PRACTICUM IN GENERAL SHOP (5). LEC. 2, LAB. 6.** Application of skills and abilities needed in teaching general shop skills to students and clients in school laboratories and rehabilitation centers.
409. **TEACHING ELECTRONICS IN INDUSTRIAL ARTS (4). LEC. 2, LAB. 6.** Pr., consent of department head. Theories and practices used in school electronic laboratories; projects designed and constructed.
410. **PROGRAMS IN HOME ECONOMICS FOR THE MIDDLE SCHOOL (4). LEC. 3, LAB. 2.** Pr., Admission to teacher education and FED 350 or equivalent. Principles of and experiences in designing middle school home economics programs; evaluation of instruction and programs.
411. **TEACHING HOME ECONOMICS EDUCATION (5). LEC. 4, LAB. 2.** Pr., admission to Teacher Education and FED 320 or equivalent. Methods and techniques of instruction using appropriate instructional materials, planning and evaluation of instruction for Home Economics.
412. **PROGRAMS IN HOME ECONOMICS EDUCATION (4). LEC. 3, LAB. 2.** Pr., admission to Teacher Education and FED 320 or equivalent. Principles of and experience in designing programs for home economics; evaluation of instruction and programs.
414. **PROGRAM IN AREA OF SPECIALIZATION (3). LEC. 2, LAB. 2.** Pr., admission to Teacher Education and FED 320 or equivalent. Program planning principles involved in designing program activities for specific areas of specialization.
415. **TEACHING IN AREA OF SPECIALIZATION (3-5). LEC. 2, LAB. 2.** Pr., admission to Teacher Education and FED 320 or equivalent. Understanding of curriculum content; methods and techniques of instruction using appropriate instructional materials; planning and evaluation of instruction for specific area of specialization.
419. **TRANSCRIPTION (5). LEC. 5, LAB. 5.** Pr., VED 312. Emphasis on improved production rates. Continued development of dictation speed. Transcription of letters with special features.
420. **OFFICE MACHINES (3). LAB. 4, LEC. 1.** Pr., junior standing and COI. Designed to give a working knowledge of various machines found in modern offices. Basic training in the use of adding machines, electronic calculators, duplicating, dictating machines, and posting machines. (Optional rotation in machine transcription, excluding Office Administration majors.)
421. **OFFICE INTERNSHIP (10). LAB. 20.** Pr., VED 422, and senior standing. (Supervised work experience open to OA majors only).
422. **SECRETARIAL PROCEDURES I (5).** Pr., VED 312, and junior standing. Analysis of requirements of profession of executive secretary or administrative assistant.
423. **SECRETARIAL PROCEDURES II (5).** Pr., VED 422, and junior standing. Major activity: The work of several long-term projects in which students benefit from long-range planning, setting of priorities, expediting of solutions to problem situations, and handling volume correspondence.
424. **ADMINISTRATIVE MANAGEMENT (3).** Pr., MN 310 or COI. Management of information in many forms, systems design, data collection and processing methods, communications and records management, office physical facilities, office performance standards and control, and motivation of personnel.
425. **PROFESSIONAL INTERNSHIP (15).** Pr., senior standing, admission to Teacher Education. Provides supervised, on-the-job experiences in a school, college, or other appropriate setting. Evaluation and analysis of the intern experience.
446. **DIRECTED INDEPENDENT STUDY (1-10).** The student's learning efforts are guided toward desired objectives. Includes evaluation by professor and student of work accomplished at regular intervals.

*The shorthand and typewriting sequence should be begun at the highest possible level because credit may be gained through advanced placement. With previous training in either, the student may enter the second, third, or fourth quarter course. If a grade of C or higher is earned, credit is given for the lower courses. If a C is not earned, advanced placement credit will not be granted. Consult with OA staff for placement.

450. **SPECIAL TOPICS (1-5).** Seniors and professors pursue cooperatively selected concepts and theoretical formulations.
457. **PRACTICUM IN GRAPHIC ARTS INSTRUCTION (3).** LAB. 6. Pr., junior standing. To prepare pre-service and in-service vocational teachers to teach graphic arts skills in printing and duplicating techniques, advertising display, and other modes of graphic communication.
462. **DIRECTED WORK EXPERIENCE IN AREA OF SPECIALIZATION (5).** LAB. 10. Pr., VED 414. In-service, supervised work experience. Individually designed for part-time and/or summer experience.
466. **TEACHING OUT-OF-SCHOOL GROUPS (3).** Pr., VED 414. Conducting surveys, occupational analysis, using advisory committees, organizing, conducting and supervising various types of adult education.
- 475-476-477-478-479-480. **TRADE AND TECHNICAL EXPERIENCE (5-5-5-5-5-5).** An experience completed by supervised employment or by examination on basis of journeyman level work experience at the maximum rate of 15 quarter hours for each year of such experience. In those occupations where there is no organized apprenticeship experience beyond the level of learner, the level of learner will correspond to starting the curriculum, elective coursework may be substituted for these credits.
495. **PRACTICUM (1-15).** Provides experiences closely relating theory and practice, usually carried on simultaneously.

ADVANCED UNDERGRADUATE AND GRADUATE

508. **TEACHING MECHANICAL TECHNOLOGY (5).** LEC. 3, LAB. 4. Pr., junior standing. Objectives and methods; equipment and management of vocational education shops; organization of projects; recent development in specialized areas of mechanics; in-service teaching problems. Students plan for demonstration of methods for teaching mechanical skills.
510. **OCCUPATIONAL INFORMATION (3).** LEC. 2, LAB. 2. Pr., junior standing.
513. **NATURE OF ADULT EDUCATION (5).** Pr., junior standing. History and principles of adult education applied to the development and implementation of programs in remedial, occupational, and continuing education.
520. **TEACHING VOCATIONAL EDUCATION TO STUDENT WITH SPECIAL EDUCATION NEEDS (5).** Pr., junior standing. Trends, issues, and program development resources for teaching vocational skills to students who are economically and educationally disadvantaged or handicapped.
524. **ADMINISTRATIVE MANAGEMENT (5).** Pr., junior standing. COI. Management of information in many forms, systems design, data collection and processing methods, communications and record management, office physical facilities, other performance standards and control and motivation of personnel.
541. **DEVELOPMENT OF VOCATIONAL EDUCATION (4).** Pr., junior standing. Historical perspective of the development of vocational education with an overview of its nature and purpose relative to the technological society.
550. **CAREER EDUCATION (4).** Pr., junior standing. Introduction of career education as a system concept encompassing the entire educational experience in K-14. Emphasis will be given to the interrelated nature of the role of the administrator, the counselor, and the classroom teacher in career education.
552. **INSTRUCTIONAL PROGRAMS IN THE CONSTRUCTION INDUSTRY (4).** LEC. 2, LAB. 4. Pr., VED 414 or 415 or graduate standing. Preparation of teachers to implement various exploratory programs of a hands-on nature that will permit students to gain insight into career opportunities offered by the construction industry.
554. **INSTRUCTIONAL PROGRAMS IN THE MANUFACTURING INDUSTRY (4).** LEC. 2, LAB. 4. Pr., VED 414 or 415 or graduate standing. Preparation of teachers to implement various exploratory programs of a hands-on nature that will permit students to gain insight into career opportunities offered by the manufacturing industry.
558. **LEARNING RESOURCES IN AREA OF SPECIALIZATION (5).** Pr., junior standing. (A) Agricultural Education; (B) Industrial Arts Education; (C) Trade and Industrial Education; (D) Distributive Education; (E) Rehabilitation; (F) Adult Education; (G) Technical Education; (H) Business; (I) Home Economics; (N) Speech Pathology; (O) Behavior Disturbance; and (P) Mental Retardation.
558. **COORDINATION AND SUPERVISION OF VOCATIONAL EDUCATION PROGRAMS IN AREAS OF SPECIALIZATION (5).** LEC. 4, LAB. 2. Pr., junior standing. Appropriate relationship between school and on the job programs, including records of coordination, student placement, improving employable skills and habits, recruitment and selection of work experience applicants, work experience rotation, public information and other similar activities.
569. **COMMUNITY PROGRAMS IN ADULT EDUCATION (5).** LEC. 4, LAB. 2. Pr., junior standing, VED 513 or COI.
574. **ORGANIZATION OF INSTRUCTION IN VOCATIONAL-TECHNICAL EDUCATION (5).** Pr., junior standing. Trade and occupational analysis, principles and procedures of identifying and selecting the skills and knowledge needed in the preparation of courses of instruction. Principles and procedures for individualizing instruction.
591. **PROBLEMS IN TEACHING THE DISADVANTAGED ADULT (3-5).** Pr., junior standing. Problems of the disadvantaged adult with special emphasis on the unique sociological, psychological, and physiological factors that influence learning and participation in remedial learning activities.

GRADUATE

- 602. TEACHER EDUCATION IN VOCATIONAL AND ADULT EDUCATION (5).** For supervisors of student teachers, teacher educators, and other graduate students. Major emphasis on administration of vocational education programs, research, problems which supervising teachers encounter.
- 603. PROBLEMS IN AGRICULTURAL OCCUPATIONS (5).** Pr., consent of department head. Securing, organizing and interpreting information for guidance and teaching purposes; curriculum development; developing instruction units and planning teaching activities for on-farm and off-farm occupations.
- 606. ORGANIZATION AND UTILIZATION OF COMMUNITY RESOURCES (5).** Pr., consent of department head. Processes through which new ideas and innovations are utilized through community organization to maximize the effective use of physical and human resources.
- 608. ADMINISTRATION OF VOCATIONAL AND PRACTICAL ARTS EDUCATION (5).** Pr., consent of department head. Preparation of professional personnel for leadership. Content includes philosophy and an application of procedures in administering and supervising new and on-going programs to meet changing socio-economic conditions.
- 609. COMPREHENSIVE PLANNING FOR VOCATIONAL EDUCATION (5).** Pr., VED 608. Processes of comprehensive planning for vocational education programs at high school and post high school centers using local, state, and regional data sources.
- 616. ORGANIZING AND TEACHING ADULT, POST-SECONDARY AND CONTINUING EDUCATION (5).** Pr., COI. Utilization of principles of andragogy in helping adults who are not full-time students benefit from adult, post-secondary, and continuing education.

Each of the following courses may be taken as (A) Agriculture, (B) Industrial Arts, (C) Trade and Industrial, (D) Distributive, (F) Adult, (G) Technical, (H) Business, (I) Home Economics.

- 625. INTERNSHIP (3-15).** Supervised, on-the-job experiences in a school, college, or other appropriate setting. These experiences accompanied by regularly scheduled, on-campus discussion periods for positive evaluation and analysis of the intern experience.
- 646. DIRECTED INDEPENDENT STUDY (1-6).** The student's learning efforts are guided toward desired objectives including evaluation by professor and student of work accomplished at regular intervals.
- 650. SEMINAR IN AREAS OF SPECIALIZATION (1-3), MAY BE REPEATED FOR CREDIT NOT TO EXCEED 10 HOURS.** Advanced graduate students and professors pursue cooperatively selected concepts and theoretical formulations.
- 651. RESEARCH STUDIES IN EDUCATION IN AREAS OF SPECIALIZATION (5).** Review, analysis, and interpretation of available research with emphasis on designing new research to meet the changing needs of the school.
- 652. CURRICULUM AND TEACHING IN AREAS OF SPECIALIZATION (5).** Teaching practices and reappraisal of selecting experiences and content for curriculum improvement.
- 653. ORGANIZATION OF PROGRAM IN AREAS OF SPECIALIZATION (5).** Program, organization, and development of basic and supplementary materials for guiding teachers, administrators, and school systems in the continuous improvement of curriculum and teaching practices.
- 654. EVALUATION OF PROGRAM IN AREAS OF SPECIALIZATION (5).** Evaluation and investigation of teaching effectiveness with attention also given to the utilization of human and material resources and the coordination of areas of specialization.

Prerequisites for the 651, 652, and 654 courses are 18 hours of appropriate subject matter and 36 hours of psychology and professional education.

- 695. PRACTICUM, (1-15).** Students get experiences closely relating theory and practice, usually carried on simultaneously.
- 696. GRADUATE RESEARCH FORUM (1).** May be repeated, but counted only once toward graduation. Presentations by graduate students of research proposals and/or findings. Analysis of procedures and findings.
- 699. RESEARCH AND THESIS (CREDIT TO BE ARRANGED).** May be taken more than one quarter.
- 798. FIELD PROJECT, (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.
- 799. RESEARCH AND DISSERTATION, (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.

Program Designators—When appropriate, certain sections of the above common offerings are identified by programs within the departments by the use of letter designations as noted below:

(A) Agriculture, (B) Industrial Arts, (C) Trade and Industrial, (D) Distributive, (F) Adult, (G) Technical, (H) Business, (I) Home Economics, (K) Office Administration, and (T) Health Occupations.

Zoology-Entomology (ZY)

Professors Hays, *Head*, Berger, Blake, Causey, Dusi, Folkerts, Harper, Mason, Mount,
and Watson

Associate Professors Alexander, Dixon, Dobie, Hyche,

Ivey, Kouskolekas, Kisano, Mullen, Pritchett, Ramsey, Speake, and M. Williams

Assistant Professors Ball, Bradley, Clark, Current, Estes, Gaylor

Lawrence, Lishak, Mirarchi, A. Williams, and Wit

Instructors Dalrymple, and Ott

Adjunct Professor Crozier

Adjunct Associate Professor Frandsen

105. **INTRODUCTORY HUMAN PHYSIOLOGY (5). LEC. 4, LAB 2.** Winter, Summer. The organ systems of the human body and their functions. For non-science majors only. Degree credit may not be earned in both ZY 105 and BI 103 or 104. This course is designed primarily for Home Economics students.
201. **MARINE BIOLOGY (6). LEC. 4, LAB. 4.** Pr., BI 101, 102, and 103. Summer. The invertebrates, vertebrates, and marine plants as communities with emphasis on local examples. Taught only at Dauphin Island Sea Laboratory. Credit may not be earned in both ZY 201 and 436.
204. **INSECTS (3). LEC. 3. GENERAL ELECTIVE.** Winter. Life processes, occurrence, and importance of insects. Degree credit may not be earned in both ZY 204 and ZY 304 or ZY 502.
205. **WILDLIFE CONSERVATION (3). LEC. 3. GENERAL ELECTIVE.** Fall, Spring. Conservation and natural history of important wildlife animals, especially Alabama species. Degree credit may not be earned in both ZY 205 and ZY 328.
206. **CONSERVATION IN THE UNITED STATES (3). GENERAL ELECTIVE.** Winter, Summer. Basic facts essential to an understanding of current problems pertaining to the conservation of our rapidly depleting natural resources such as soil, water, minerals, forest, and wildlife. Especially planned for elementary and high school teachers.
207. **BIRDS (3). LEC. 3. GENERAL ELECTIVE.** Summer, Winter. Birds in relation to agriculture and game management, recognition of various species, flight, songs, color markings, and feeding habits. Degree credit may not be earned in both ZY 207 and ZY 522.
209. **BEE CULTURE (3). LEC. 2, LAB 3. GENERAL ELECTIVE.** Spring, Summer, Fall. Manipulation and production of bees and honey, and a consideration of bee diseases.
210. **INTRODUCTION TO OCEANOGRAPHY (3). LEC. 3. GENERAL ELECTIVE.** Winter. The earth as a single ecological system, the interrelationship between the continents and the oceans, major features of the physics, chemistry, geology, and biology of the oceans and their importance to man. Degree credit may not be earned in both ZY 210 and ZY 435.
250. **HUMAN ANATOMY (5). LEC. 3, LAB. 5.** Pr., BI 101. All quarters. The structure of the human body combined with a comprehensive study and dissection of a large mammal. Structural similarities and dissimilarities will be emphasized in the laboratory. A common laboratory section will meet one day at the lecture hour and the two-hour dissection laboratories will meet in small groups by sections.
251. **PHYSIOLOGY (5). LEC. 4, LAB. 3.** Pr., BI 103 or ZY 250. All quarters. Function of mammalian systems with emphasis on man. Laboratory exercises will provide students with an opportunity to validate functions on laboratory animals.
300. **GENETICS (5). LEC. 4, LAB. 3.** Pr., BI 101 and college algebra or equivalent. Basic genetic principles, theoretical basis for genetic systems, and modern areas of research. Laboratory emphasizes biometrical analysis of experiments using plants and animals. A common laboratory-recitation session will meet on the "fifth day" at the lecture hour, and a two-hour data collecting laboratory will meet in small groups by sections.
301. **COMPARATIVE ANATOMY (5). LEC. 3, LAB. 6.** Pr., BI 103. Winter, Spring, Summer. Comparisons of the systems of the vertebrates.
302. **VERTEBRATE EMBRYOLOGY (5). LEC. 3, LAB. 6.** Pr., BI 103. All quarters. Fertilization, cleavage, morphogenesis, and organogenesis of the frog, chick, pig, and human from a descriptive and analytical viewpoint.
303. **PRINCIPLES OF EVOLUTION AND SYSTEMATICS (5). LEC. 5.** Pr., BI 102 or 103. Winter, Spring, Summer. The major processes, methods, and philosophic basis for present day concepts of evolution and systematics.
304. **GENERAL ENTOMOLOGY (5). LEC. 4, LAB. 3.** Pr., BI 103. Fall, Spring. Introduction to the biology and diversity of insects.
305. **FOREST ENTOMOLOGY (3). LEC. 2, LAB. 3.** Pr., BI 103. Fall, odd years, Spring. Entomology in relation to insects of forests and forest products; recognition, life histories, and control of major insects of forests. Forestry students only.
306. **PRINCIPLES OF ECOLOGY (5). LEC. 4, LAB. 3.** Pr., 10 hrs. Biology or COL. Fall, Spring, Summer. The physical and biotic factors of the environment and the interactions of these with plants and animals. The organization and functions of communities and populations.
307. **INTRODUCTION TO OCEANOGRAPHY (6). LEC. 4, LAB. 4.** Pr., college algebra, general chemistry, and general physics. Summer. The physics, chemistry, biology, and geology of the oceans. Taught only at the Dauphin Island Sea Laboratory. Credit may not be earned in both ZY 307 and ZY 435.

- 308. MICROLOGY (5). LEC.-LAB 9.** Pr., BI 103 and CH 207-208 or COI. All quarters. Laboratory methods of fixation, embedding, sectioning, staining, and mounting of animal tissues, and an introduction to techniques of light microscopy.
- 310. CELL BIOLOGY (5). LEC. 4, LAB. 3.** Pr., 10 hours of General Biology and CH 207. All quarters. Morphology and physiology of cell membranes, cytoplasm, and the formed elements of the cytoplasm and nucleus. Cell division, molecular transport, cellular homeostasis, and biochemical pathways of energy production.
- 316. PHYSIOLOGY OF DOMESTIC ANIMALS (5). LEC. 4, LAB. 3.** Pr., BI 103. Fall, Spring. Function of mammalian systems with emphasis on domestic mammals. Degree credit may not be earned in both ZY 316 and ZY 251 or ZY 524.
- 328. PRINCIPLES OF WILDLIFE MANAGEMENT (5). LEC. 4, LAB. 3.** Pr., a course in ecology. Fall, Spring. Fundamentals of game management theory, application, and administration.
- 360. PHYSIOLOGICAL ASPECTS OF AGING (3). LEC. 3.** Winter. Pr., BI 103 or ZY 105. The effects of aging and disease states associated with aging upon the functional status of the various organs and systems of the body.
- 403. PESTICIDES (5). LEC. 4, LAB. 3.** Pr., CH 207. Winter. The chemistry, mode of action, activity, formulations, applications, safety and legal aspects of pesticides and pesticide application.
- 405. APPLIED ENTOMOLOGY (5). LEC. 4, LAB. 3.** Pr., ZY 403. Spring. Biology, economic importance and management of the more important insect pests in each of the various agricultural commodity groups.
- 406. INSECT PEST MANAGEMENT (5). LEC. 4, LAB. 3.** Pr., ZY 405. Fall. Methods of incorporating available insect control practices into management systems that will effectively control target pests while minimizing deleterious effects on the environment.
- 407. CONCEPTS OF PEST MANAGEMENT (5). LEC. 4, LAB. 3.** Pr., COI. Spring. Pest management technology and philosophy.
- 416. STUDIES AND TECHNIQUES IN FIELD BIOLOGY AND ECOLOGY (10).** Pr., major or minor in a biological field, COI; junior standing. Summer, odd years. A field trip away from the southeastern United States. Practical experience in the collection and preservation of specimens. Studies of basic ecological phenomena in a field situation. Stops at institutions to visit outstanding biologists and see field biology research in action. May not be taken concurrently with other courses. A fee, varying with the nature and extent of the trip, will be charged.
- 425. FOREST WILDLIFE MANAGEMENT (3). LEC. 3.** Pr., FY 520 or COI. Winter. Wildlife management as applied to forest properties. Restricted to students in forestry.
- 433. FISH AND WILDLIFE LAW ENFORCEMENT (3). LEC. 3.** Pr., junior standing. Spring, odd years. Basic principles and techniques of fish and wildlife laws and law enforcement. Restricted to students in Fisheries or Wildlife Management.
- 435. GENERAL OCEANOGRAPHY (3). LEC. 3.** Pr., acceptable physics, chemistry, and mathematics background. Winter. Physical, chemical, and geological characteristics of the oceans, especially as they relate to present understanding of marine ecology and the biological productivity of marine waters.
- 436. MARINE BIOLOGY (3). LEC. 3.** Pr., invertebrate zoology, general physiology. Winter. Marine organisms, their physiological adaptations to the environment, with emphasis on respiration, nutrition and feeding, osmoregulation, reproduction, and biological associations in the context of ecology.
- 498. SPECIAL PROBLEMS (1-3).** Pr., senior standing. A. Zoology; B. Entomology; C. Wildlife Management. D. Marine Biology. A student can register for a total of not more than three hours credit.

ADVANCED UNDERGRADUATE AND GRADUATE

- 501. INVERTEBRATE ZOOLOGY (5). LEC. 3, LAB. 6.** Pr., BI 103. Winter, Summer. Biology, taxonomy, and ecology of invertebrate animals.
- 502. ECONOMIC ENTOMOLOGY (5). LEC. 4, LAB. 3.** Fall, Spring, Summer. Consideration of the biological aspects, life histories, and control of insects. Not for graduate credit for students in School of Agriculture departments.
- 504. MEDICAL ENTOMOLOGY (5). LEC. 4, LAB. 3.** Pr., ZY 304. Spring, even years. Insects, mites, and other arthropods of medical or public health importance with emphasis on recognition and biology of pest species and the epidemiology of arthropod-borne diseases.
- 505. FOREST INSECTS (5). LEC. 4, LAB. 3.** Pr., ZY 304, 305, or 502. Fall, even years. Principal insects of forests and forest products; their importance, taxonomy, bionomics, and control.
- 507. GENERAL INSECT MORPHOLOGY (5). LEC. 3, LAB. 6.** Pr., ZY 304. Winter. Comparative external anatomy and generalized internal structures of insects; characteristics used in taxonomy will be emphasized.
- 509. HISTOLOGY (5). LEC. 3, LAB. 6.** Pr., BI 103. All quarters. Morphology and classification of tissues; arrangement of tissues in organs and systems of vertebrate animals.
- 510. SYSTEMATIC ENTOMOLOGY (5). LEC. 3, LAB. 6.** Pr., ZY 304. Spring. Principles of systematics and identification of insects through orders, families, genera, and species.
- 511. GENERAL PARASITOLOGY (5). LEC. 3, LAB. 6.** Pr., BI 103. All quarters. Origin, adaptations, physiology, and ecology of parasites. Identification and life histories of representative parasitic protozoa, helminths, and arthropods with emphasis on host-parasite relationships.
- 514. AQUATIC INSECT BIOLOGY. LEC. 3, LAB. 6.** Pr., ZY 304. Fall. Ecology, systematic, and identification of aquatic and semiaquatic insects. Some emphasis will be placed on groups of significance in food webs or of value as indicator organisms. A collection will be required. Some weekend field trips will be taken.

- 515. LIMNOLOGY (5). LEC. 3, LAB. 6.** Pr., CH 104, PS 205, BI 103. Spring. Biological, chemical, and physical factors affecting aquatic life.
- 517. QUANTITATIVE GENETICS (5). LEC. 4, LAB. 3.** Pr., ZY 300, BY 517 or by consultation with instructor. Spring. The description and inheritance mode of traits exhibiting continuous variation; analytical procedures and methodology of computer use in genetics.
- 518. NON-MENDELIAN GENETICS (3).** Pr., ZY 300. Fall. Current status of behavioral, cytogenetic, cytoplasmic, developmental, and recombinational genetics.
- 519. MOLECULAR GENETICS (3).** Pr., ZY 300. Winter, even years. Current status of molecular genetics: nucleic acids, regulation, mutagenesis, and immunology will be considered.
- 520. HUMAN GENETICS (5). LEC. 5.** Pr., ZY 300, CH 208. Spring, Summer. Effects of normal and abnormal chromosome complements, the biological interaction of genes, and the effects of mutation and changes in gene frequency on human populations; problems in small sample analysis, biochemical screening of human "carriers," and the prospects for genetic engineering.
- 521. VERTEBRATE ZOOLOGY I (5). LEC. 3, LAB. 6.** Pr., BI 103. Fall. Spring, Summer. Taxonomy, ecology, and evolution of fishes, amphibians, and reptiles.
- 522. VERTEBRATE ZOOLOGY II (5). LEC. 3, LAB. 6.** Pr., BI 103. Fall, Spring, Summer. Taxonomy, ecology, evolution, and some biological principles of birds and mammals. Laboratory studies in radio-telemetry, bioacoustics, and population dynamics are used in addition to classical vertebrate zoology exercises.
- 524. ANIMAL PHYSIOLOGY (5). LEC. 4, LAB. 3.** Pr., Biochemistry or ZY 310, CH 208. Fall, Spring, Summer. General physiological principles common to animals of various taxa illustrated with examples that are most demonstrative. An effort is made to include unique physiological adaptations.
- 528. WILDLIFE BIOLOGY (5). LEC. 3, LAB. 6.** Pr., ZY 328. Fall, Winter. The ecology of wildlife populations and their relations to natural habitat. Laboratory work will consist of practical exercises designed to acquaint the student with modern methodology and technique in studying wild bird and mammal populations.
- 531. WILDLIFE HABITAT ANALYSIS (3). LEC. 1, LAB. 6.** Pr., ZY 528, BY 506. Fall. Summer, odd years. Practical exercises in vegetation analysis, utilization studies, aerial photograph interpretation, and cover type mapping.
- 536. BIOLOGICAL OCEANOGRAPHY (5). LEC. 5.** Pr., ZY 435 or COI. Spring. Oceanic ecosystems, biological productivity of the oceans, energy transfer in oceanic food chains, and an introduction to biological oceanographic investigation.
- 538. GENERAL ICHTHYOLOGY (5). LEC. 3, LAB. 6.** Pr., BI 103. Fall. Morphological, functional, geographical, and behavioral survey of fishes. Classification of fishes using monographs and keys. Field trips and laboratory work will emphasize local species.
- 542. MARINE FISHERIES MANAGEMENT (6). LEC. 3, LAB. 9.** Pr., 18 hrs. of biology including BI 103. Summer. Fisheries management philosophy, objectives, problems, and principles involved in management decisions. Offered only at the Gulf Coast Laboratory, Ocean Springs, Mississippi.
- 543. MARINE VERTEBRATE ZOOLOGY AND ICHTHYOLOGY (9). LEC. 5, LAB. 12.** Pr., 18 hours of biology including BI 103. Summer only. The marine chordata, including lower groups and the mammals and birds, with most emphasis on the fishes. Offered only at the Gulf Coast Research Laboratory, Ocean Springs, Mississippi.
- 545. MARINE INVERTEBRATE ZOOLOGY (9). LEC. 5, LAB. 12.** Pr., 18 hrs. biology including BI 103 and ZY 501. Summer. The marine invertebrates, especially those of the Mississippi Sound region. Emphasis is placed on the structure, classification, phylogenetic relationships, and functional processes. Offered only at the Gulf Coast Laboratory, Ocean Springs, Mississippi.
- 548. MARINE ECOLOGY (7½). LEC. 3, LAB. 6.** Pr., BI 102, ZY 501, and acceptable chemistry. Summer. The relationship of marine organisms to their environment, and the effects of the environment on the abundance and distribution of marine organisms. Offered only at the Gulf Coast Laboratory, Ocean Springs, Mississippi.
- 550. ZOOGEOGRAPHY OF THE VERTEBRATES (5). LEC. 4, LAB. 3.** Pr., ZY 521, or COI. Spring, Fall, even years. Principles of geographic distribution of vertebrate animals.
- 551. MARINE INVERTEBRATE ZOOLOGY I (6). LEC. 4, LAB. 4.** Pr., BI 101 and 103. Summer. The taxonomy, life cycles, ecology, and evolution of the lower invertebrates, Protozoa through Mollusca. Taught only at the Dauphin Island Sea Laboratory. This course may not be substituted for ZY 501.
- 552. MARINE INVERTEBRATE ZOOLOGY II (6). LEC. 4, LAB. 4.** Pr., ZY 410. Summer. A continuation of ZY 410 including the Annelida through the Protochordata. Taught only at the Dauphin Island Sea Laboratory. This course may not be substituted for ZY 501.
- 553. MARINE VERTEBRATE ZOOLOGY (6). LEC. 4, LAB. 4.** Pr., BI 101, 103 and COI. Summer. The systematics, zoogeography, and ecology of marine fishes, reptiles, and mammals. Taught only at the Dauphin Island Sea Laboratory. This course may not be substituted for ZY 521 and/or ZY 522.
- 554. COASTAL ORNITHOLOGY (6). LEC. 3, LAB. 9.** Pr., ZY 522. Summer. Coastal and pelagic birds with emphasis on ecology, taxonomy, and distribution. Taught only at the Dauphin Island Sea Laboratory. This course may not be substituted for ZY 605.
- 555. MARINE ECOLOGY (6). LEC. 3, LAB. 9.** Pr., ZY 306, college physics and chemistry, and COI. Summer. Bioenergetics, community structure, population dynamics, predation, competition, and speciation in marine eco-systems. Taught only at the Dauphin Island Sea Lab.
- 556. BEHAVIOR AND NEUROBIOLOGY OF MARINE ANIMALS (6). LEC. 5, LAB. 10.** Pr., 20 hours of Zoology, Psychology, and COI. Survey of the behavior, neuroanatomy, and neurophysiology of selected marine invertebrates and vertebrates. Taught only at the Gulf Coast Research Laboratory.

560. **MAMMALIAN PHYSIOLOGY I (5). LEC. 4, LAB. 3.** Pr., CH 208, ZY 250 or equivalent, and ZY 310 or Biochemistry. Pharmacy students or COI. Fall, Spring. A treatment of cellular bioelectric phenomena, muscle contractility, neurophysiology, and cardiovascular physiology. Laboratory will utilize modern methodology for the observation of physiological fact.
561. **MAMMALIAN PHYSIOLOGY II (5). LEC. 4, LAB. 3.** Pr., ZY 560 or equivalent. Pharmacy students or COI. Winter, Summer. A continuation of ZY 560 with emphasis upon respiratory, renal, digestive, metabolic, and endocrine physiology.
565. **ETHOLOGY (5). LEC. 4, LAB. 3.** Pr., ZY 306, 522, 524 or COI. Spring, even years. Animal behaviors, analysis of their adaptive values, development, and evolution.

GRADUATE

601. **INSECT MORPHOLOGY AND EMBRYOLOGY (5). LEC. 3, LAB. 6.** Pr., ZY 507. Fall. A comparative selected arthropod structures study and a consideration of embryological development and metamorphosis in insects.
603. **INSECT PHYSIOLOGY (5). LEC. 3, LAB. 6.** Pr., ZY 524 and ZY 601. Spring, even years. General and comparative physiology of the organ systems of insects. A minimum of two literature reviews will be made by each student during the quarter.
604. **TOXICOLOGY OF INSECTICIDES (5). LEC. 4, LAB. 3.** Winter. Toxic action of insecticides; analysis, preparation and use of insecticides; spray residues in relation to health; research methods in insect toxicology.
605. **ORNITHOLOGY (5). LEC. 3, LAB. 6.** Pr., ZY 522. Spring. Ecology and behavior of birds.
606. **MAMMALOLOGY (5). LEC. 3, LAB. 6.** Pr., ZY 522. Winter. Taxonomy, ecology, and behavior of mammals.
607. **FARM WILDLIFE MANAGEMENT (5). LEC. 3, LAB. 6.** Pr., ZY 528. Winter, odd years. Application of game management theories, techniques, and administration with special emphasis on farm game species. For graduate students majoring in Game Management or Fisheries Management.
608. **FOREST WILDLIFE ECOLOGY (5). LEC. 5.** Pr., ZY 528. Summer, even years. Intensive investigations into current aspects of the ecology of the important forest game animals, especially those of the southeastern U.S.
609. **ADVANCED APPLIED ENTOMOLOGY (5). LEC. 4, LAB. 3.** Pr., ZY 502. Fall. Integrated control of the principal insects by environmental, biological, genetic, chemical, and legal means.
610. **IMMATURE FORMS OF INSECTS (5). LEC. 2, LAB. 6.** Pr., ZY 510. Winter. Structure and identification of immature forms of insects; methods of collecting and preserving; development and use of keys for classifying immature insects.
611. **PRINCIPLES OF SYSTEMATIC ZOOLOGY. LEC. 5.** Pr., ZY 303. Winter, odd years. Contemporary systematic philosophies including the species problem, phylogeny, and classification.
612. **ADVANCED INSECT TOXICOLOGY (5). LEC. 4, LAB. 3.** Pr., ZY 604. Spring, odd years. Mode of action, mode of entry, relation of chemical structure to toxicity, and precision methods of determination of insecticides; recent developments in the field of insecticide chemistry.
613. **INSECT PATHOLOGY (5). LEC. 3, LAB. 4.** Pr., BY 300, ZY 502 and COI. Winter, even years. The microorganisms associated with diseases in insects and their pathological effects on insects and insect populations.
614. **BIOLOGICAL CONTROL OF INSECTS (5). LEC. 4, LAB. 3.** Pr., ZY 502. Spring, odd years. Biology, ecology, classification, and behavior of predators, parasites, and disease agents influencing insect populations. Utilization of biotic agents for management of pest populations.
616. **SYSTEMATIC ICHTHYOLOGY (3). LEC. 1, LAB. 6.** Pr., ZY or FAA 538 COI. Winter, odd years. Fishes of the world; their morphology, distribution and use to man. The course stresses individual work with world faunistic literature, revision and museum materials.
618. **ADVANCED INVERTEBRATE ZOOLOGY (5). LEC. 3, LAB. 6.** Pr., ZY 501 or COI. Spring, odd years. The biology of minor invertebrate phyla with special emphasis on morphology and taxonomy.
619. **COMPARATIVE INVERTEBRATE PHYSIOLOGY (5). LEC. 4, LAB. 3.** Pr., ZY 501 and COI. Spring, even years. The physiological mechanisms of invertebrates with special emphasis on respiration, excretion, reproduction, locomotion, nutrition, circulation, and behavior.
620. **ARACHNOLOGY (5). LEC. 3, LAB. 5.** Pr., ZY 304. Spring, odd years. Biology, behavior, and systematics of arachnids with major emphasis on spiders and mites.
622. **HISTORY AND LITERATURE OF ZOOLOGY (4). LEC. 3, LAB. 3.** Pr., graduate standing. Fall, even years. A historical review of the classical authors and great works in zoological literature. Laboratory will concentrate on examining and learning to use journals, abstracts, and reference materials in the library.
623. **ORGANIC EVOLUTION (5).** Pr., ZY 300. Fall, Summer. Evolutionary principles as illustrated by the various biological disciplines, particularly genetics, paleontology, zoogeography, and systematics in general.
627. **IMMUNOLOGY AND PHYSIOLOGY OF PARASITES (5). LEC. 3, LAB. 6.** Pr., ZY 511, BY 300, ZY 524, and COI. Winter, even years. Immunity mechanisms to infections of protozoan and helminth parasites. Chemical physiology of host-parasite relationship to include nutrition, metabolism, toxicity, and chemotherapy.
629. **ADVANCED QUANTITATIVE GENETICS (5). LEC. 4, LAB. 2.** Pr., ZY 517. Fall, odd years. Advanced concepts of analyzing quantitative genetic characters in plant and animal species.

630. **ADVANCED GENETICS (5).** Pr., ZY 300 and ZY 518. Winter, odd years. Non-Mendelian hereditary systems; regulation of gene action as it influences growth, differentiation, and development; and the status of contemporary genetics research.
631. **BIOCHEMICAL GENETICS (3).** Pr., ZY 300, 302, 519, coreq. ADS 519. Winter odd years. Gene action on the biochemical level pertaining to early development, growth and differentiation, and aging. Principles of gene regulation and organization derived from both prokaryotic and eukaryotic systems are discussed.
632. **HELMINTHOLOGY (5). LEC. 3, LAB. 6.** Pr., ZY 511. Spring, even years. Advanced morphology, physiology, life cycles, and host-parasite relationships of helminths. Opportunity for making extensive literature studies and collections of the parasites of a particular group of animals in which the student is most interested.
634. **PROTOZOOLOGY (5). LEC. 3, LAB. 6.** Pr., ZY 511. Winter. Free-living and parasitic protozoa important to agriculture, wildlife, and man. Morphology, physiology, reproduction, ecology, and life histories will be emphasized.
635. **FURBEARER AND WATERFOWL MANAGEMENT (5). LEC. 3, LAB. 6.** Pr., ZY 528. Winter, even years. Furbearer and waterfowl resources. Emphasis on problems of management and utilization.
636. **ECOLOGY OF ANIMAL POPULATIONS (4). LEC. 4.** Pr., ZY 306. Winter. Structure, dynamics, and natural regulatory mechanisms of animal populations; survival strategies emphasizing reproduction, competition, and adaptations to environmental changes.
637. **HERPETOLOGY (5). LEC. 1, LAB. 8.** Pr., ZY 521. Spring, even years. The morphology, taxonomy, ecology, and behavior of amphibians and reptiles. Laboratory collecting, preserving, and identification of local specimens will be an important consideration.
644. **PHYSIOLOGY OF THE CELL (3).** Pr., ZY 310 and 524. Winter, even years. Basic physiological processes at the cellular level with the tools and approaches of physical science.
645. **NEUROBIOLOGY (5). LEC. 3, LAB. 6.** Pr., ZY 524. Winter. Morphology, physiology, and evolution of the central, autonomic, and neurohormonal systems of the vertebrate.
647. **ENDOCRINOLOGY (5).** Pr., ZY 524 and AH 519. Spring. A comprehensive treatment of the classical and modern literature of endocrinology.
648. **EXPERIMENTAL ENDOCRINOLOGY (5). LAB. 10.** Pr., ZY 647 or taken concurrently. Spring, odd years. Laboratory studies of endocrine control mechanisms utilizing surgical, bioassay, biochemical assay, histochemical, and autoradiographic methods and techniques.
649. **PHYSIOLOGICAL ECOLOGY (4). LEC. 3, LAB. 3.** Pr., ZY 524 or COI. Winter, even years. The physiological adaptations of animals to the specific physical and biotic environments in which they live.
693. **SEMINAR. (CREDIT TO BE ARRANGED.)**
697. **PROBLEMS IN MARINE ZOOLOGY (4-9).** Pr., ZY 542 or 548. All year. Supervised research on specific problems in marine zoology for graduates. Offered only at The Gulf Coast Research Laboratory, Ocean Springs, Mississippi.
698. **SPECIAL PROBLEMS (2-5).** All quarters. A. Zoology; B. Entomology; C. Apiculture; D. Parasitology; E. Physiology; F. Wildlife.
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)**
799. **DOCTORAL RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)**

Faculty and Staff

1981-82

(The parenthetical designation after a faculty member's title indicates his department. The first date after the title indicates the year of first appointment to any position in the institution; the second, the year of appointment to present rank.)

GENERAL ADMINISTRATIVE OFFICERS

- FUNDERBURK, H. HANLY, Jr.**, *President*, 1955, 1980. B.S., M.S., Auburn; Ph.D., LSU
- COX, J. GRADY**, *Executive Vice President*, 1980. B.S., M.S., Auburn; Ph.D., Purdue
- WILSON, STANLEY P.**, *Vice President for Agriculture, Home Economics, and Veterinary Medicine*. B.S., M.S., Auburn; Ph.D., Oklahoma State
- LITTLETON, TAYLOR D.**, *Vice President for Academic Affairs and Professor (English)*, 1957, 1972. B.S., M.A., Ph.D., Florida State
- CARROLL, CHESTER C.**, *Vice President for Research and Dean of Engineering*, 1965, 1981. B.S.E.E., M.S.E.E., Ph.D., Alabama
- JACOBS, GROVER T.**, *Financial Adviser to the President*, 1976, 1980. B.S., Troy State; M.S., Peabody; L.L.B., Jones Law Institute; Ed.D., Auburn
- GRANT, W. HAROLD**, *Dean of Students & Professor (Counselor Education)*, 1957, 1980. B.S., Auburn; Ed.D., Columbia
- BRADBERRY, GEORGE L.**, *Executive Director of Alumni Association, Director of Development*, 1951, 1979. B.S., Georgia
- Athletic Director** To be named
- HOLSENBECK, DANIEL C.**, *Director of University Relations*, 1969, 1980. B.S., Auburn; M.Ed., Johns Hopkins; Ph.D., Florida State
- PARKS, PAUL F.**, *Dean of The Graduate School and Professor (Animal & Dairy Sciences)*, 1965, 1972. B.S., M.S., Auburn; Ph.D., Texas A&M

ACADEMIC ADMINISTRATIVE OFFICERS AND FACULTY

- ROUSE, R. DENNIS**, *Dean of Agriculture*, 1949, 1972. B.S., M.S., Georgia; Ph.D., Purdue
- McPHEETERS, E. KEITH**, *Dean of Architecture and Fine Arts and Professor (Architecture)*, 1969. B.Arch., Oklahoma State; M.F.A. in Architecture, Princeton
- HOBBS, EDWARD H.**, *Dean of Arts and Sciences and Professor (Political Science)*, 1967. A.B., N. Carolina; M.A., Alabama; Ph.D., Harvard
- HORTON, GEORGE R., JR.**, *Dean of Business and Professor (Market. and Transp.)*, 1968, 1973. B.S., M.S., Auburn; Ph.D., Virginia
- BLACKBURN, JACK E.**, *Dean of Education*, 1975. B.S., Florida State; M.A. Peabody; Ed.D., New York
- BRAMLETT, GENE A.**, *Dean of Extension & Public Service*, 1975, 1980. B.S., Murray State; M.S., Ph.D., Kentucky
- CARROLL, CHESTER C.**, *Dean of Engineering and Professor (Electrical Engineering)*, 1965, 1981. B.S.E.E., M.S.E.E., Ph.D., Alabama
- GALBRAITH, RUTH L.**, *Dean of Home Ec. and Professor (Consumer Affairs)*, 1970, 1973. B.S., Ph.D., Purdue
- WOODY, MARY F.**, *Dean and Professor of Nursing*, 1979. R.N., Charity of New Orleans; B.S.N., M.A.N.A., Columbia
- COOPER, BEN F.**, *Dean of Pharmacy & Professor*, 1973. A.B., B.S., M.S., Ph.D., N. Carolina
- VAUGHAN, JOHN T.**, *Dean of Veterinary Medicine*, 1974, 1977. D.V.M., M.S., Auburn
- AADLAND, ROLF K.**, *Assistant Professor (Geology)*, 1980. B.S., Houston; M.S., Nebraska; Ph.D., Idaho
- ABBETT, VANCE N.**, *Adjunct Instructor (Political Science)*, 1980. B.S., Troy State
- ABBOTT, SHARON C.**, *Instructor (Voc. & Adult Ed.)*, 1980. B.S., Saint Bernard; M.S., Alabama
- ABNEY, LOUIS O.**, *Professor (Art)*, 1950, 1967. B.A.A., M.A.A., Auburn
- ACAMPORA, PATRICK A.**, *Instructor (Theatre)*, 1979. B.S., Newark; B.F.A., Florida Atlantic; M.F.A., Purdue
- ADAMS, FRED**, *Professor (Agronomy & Soils)*, 1955, 1965. B.S., M.S., LSU; Ph.D., California

- ADAMS, FREDERICK P., Assistant Professor (Management), 1973, 1975. B.S.E.E., Auburn; B.S.I.M., Mass. Inst. of Tech.; M.B.A., Alabama; Ph.D., Florida State
- ADAMS, JAMES W., Associate Professor (Market. & Transp.), 1969. B.B.A., M.B.A., D.B.A., Georgia State
- ADAMS, MURRAY, JR., Associate Professor & Head (Soc. & Anthro.), 1964, 1979. B.A., M.A., Mississippi; Ph.D., Kentucky
- ADERHOLDT, ROBERT W., Assoc. Professor (Build. Science), 1969, 1980. B.M.E., Auburn; M.S.M.E., Auburn; Ph.D., Georgia Tech
- ADRIAN, JOHN L., JR., Assistant Professor (Ag. Ec. & Rural Soc.), 1974. B.A.A., M.S., Auburn; Ph.D., Tennessee
- ALDERMAN, C. WAYNE, Assistant Professor (Acct. & Fin.), 1977. B.S., M.S., M.B.A., Auburn; D.B.A., Tennessee
- ALBERT, R. A., JR., Associate Professor (Small Animal Surgery & Medicine), 1962, 1977. D.V.M., M.S., Auburn
- ALEXANDER, DAVID E., Assistant Professor (Music), 1972. B.M., M.M., Texas
- ALEXANDER, HERMAN D., Associate Professor (Zoology-Entomology), 1950, 1966. B.S., M.S., Ph.D., Auburn
- ALEXANDER, MILTON J., Professor (Management), 1968, 1975. B.S., Illinois; M.B.A., St. Louis; D.B.A., Georgia State
- ALFORD, WILLIAM L., Associate Dean (Arts & Sciences) & Professor (Physics), 1952, 1964. B.A., Vanderbilt; M.S., Ph.D., California Tech
- ALISON, MONTGOMERY W., JR., Research Associate (Agron. & Soils), 1979. B.S., Auburn
- ALLEN, CONRAD M., Associate Professor (Coun. Ed.), 1969. B.S., Alabama; M.A., Houston; Ph.D., S. Mississippi
- ALLEN, ELIZABETH G., Associate Professor (Elem. Ed.), 1969, 1975. B.A., Alabama; M.Ed., Ph.D., S. Mississippi
- ALLEN, JACQUELINE K., Instructor (Consumer Affairs), 1978. B.S., M.S., Kentucky
- ALLEN, THOMAS, Supply Supervisor University Bookstore, 1973, 1974
- ALLEN, WARD SYKES, Hargis Professor (English), 1964, 1973. B.A., M.A., Ph.D., Vanderbilt
- ALLEN, WILLIAM H., JR., Professor (Marketing), 1966, 1972. A.B., Centre; J.D., M.A., Alabama; B.D., Union Theological Seminary
- ALLEY, ALVIN D., Professor (Secondary Education), 1966, 1980. B.A., M.A., Ph.D., Florida State
- ALLISON, RAY, Associate Professor (Fish. and Allied Aqua.), 1950, 1963. B.S., W. Carolina; M.S., N. Carolina State; Ph.D., LSU
- ALVerson, WILLIAM J., JR., Assistant to the Dean (School of Agriculture), 1965, 1974. B.S., M.Ed., Auburn
- AMACHER, RICHARD E., Hargis Professor (English), 1957, 1965. A.B., Ohio; Ph.D., Pittsburgh
- AMLING, HARRY J., Professor (Horticulture), 1958, 1968. B.S., Rutgers; M.S., Delaware; Ph.D., Michigan State
- ANDELSON, ROBERT V., Professor (Philosophy), 1965, 1973. A.B. equiv., Chicago; A.M., Ph.D., S. Calif.
- ANDERSON, GLENN A., Humanities Ref. Librarian (Library), 1978. B.A., M.A., SUNY; M.L.S., Florida State
- ANDERSON, JOEL L., Assistant Professor (Rehab. & Spec. Ed.), 1967. B.S.E., M.R.C., Florida; Ed.D., Auburn
- ANDREWS, GLENN M., Coordinator of Admin. Services (Voc. & Adult Ed.), 1975, 1980. A., Maryland; M.Ed., Ed.D., Auburn
- ANGOTTI, VINCENT L., Head Professor (Theatre), 1978. B.A., St. Louis; M.A., Ph.D., Kansas
- ARMENAKIS, ACHILLES A., Director A.T.A.C. and Associate Professor (Management), 1973, 1977. B.S., M.B.A., Louisiana Tech.; D.B.A., Mississippi State
- ARMOUR, MARY ANN, Director, Project Uplift, 1974. B.S., Kentucky; M.A., Stetson
- ARNOLD, MORDECAI R., Instructor (Speech Comm.), 1979. B.A., Troy State; M.A.C.T.; Auburn
- ASKEW, RAYMOND F., Professor & Interim Head (Mech. Engr.), 1960, 1980. B.S., Birmingham-Southern; M.S., Ph.D., Virginia
- ATKINS, ALWYN J., Professor and Head (Sec. Ed.), 1956, 1964. B.S., Chattanooga; M.S., Ph.D., N. Carolina
- ATTLEBERGER, MARIE H., Associate Professor (Microbiology), 1947, 1959. D.V.M., M.S., Auburn; Ph.D., Alabama
- AUGUST, JOHN R., Assistant Professor (Small Animal Surgery & Medicine), 1973, 1977. B.Vet. Med., M.R.C.V.S., Royal Vet. College, London; M.S., Auburn
- AULL, JOHN L., Associate Professor (Chemistry), 1974, 1980. A.B., N. Carolina; Ph.D., N. Carolina State
- AUTREY, STEPHEN J., Extension Associate (Rehab. & Special Education), 1978. B.S., M.S., Auburn
- AVERY, A. HENRY, Director, Birmingham Office, Engineering Extension, 1972. B.M.E., Auburn; M.S.I.M., Purdue
- BACKMAN, PAUL A., Associate Professor (Botany, Plant Pathology & Microbiology), 1971, 1977. B.S., Ph.D., California
- BAGGETT, WILLIAM C., JR., Associate Professor (Art), 1968, 1978. B.F.A., M.F.A., Auburn
- BAGWELL, JAMES E., Assistant Professor and Acting Head (Geography), 1950, 1956. B.S., M.S., N. Carolina
- BAKER, CLINTON A., Professor and Head (Market. and Transp.), 1974. B.S., Louisville; M.B.A., D.B.A., Indiana
- BAKER, J. MARSHALL, Professor (Chemistry), 1957, 1965. B.S., Missouri Valley; M.S., Ohio State; Ph.D., Missouri
- BAKER, RICHARD A., Professor and Head (Voc. & Adult Ed.), 1963, 1978. B.S., M.S., Ed.D., Oklahoma State
- BALL, JOHN COOPER, JR., Assistant Director of Purchasing, 1967, 1974. B.S., M.E., Auburn
- BALL, MARY U., Assistant Professor (Zoology-Entomology), 1974. B.S., Trinity; M.S., Ph.D., Texas A&M
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- ZALIK, RICHARD A., Associate Professor (Mathematics), 1978, 1980. M.A., Buenos Aires; D.Sc., Israel Tech
- ZARDKOOHI, ASGHAR, Assistant Professor (Economics), 1977. B.A., Abadan; M.S., Auburn; Ph.D., Va. Tech
- ZELDIS, MURIEL, Librarian II (Library), 1979. A.B., A.M., Pennsylvania; M.S., Drexel
- ZENOR, PHILLIP L., Professor (Mathematics), 1968, 1978. B.S., M.S., Ph.D., Houston
- ZIEGLER, EVELYN A., Administrative Assistant, Arts and Science, 1956, 1976
- ZIEGLER, PAUL F., Associate Professor (Chemistry), 1949, 1958. B.S., Otterbein; M.S., Ph.D., Cincinnati
- ZORR, PAUL A., JR., Associate Professor (Architecture), 1980. B.A., M.S., Illinois Inst. of Tech
- ZURADA, JACEK, Visiting Scientist (Elec. Eng.), 1979. M.S., Ph.D., Gdansk Tech., Poland

EMERITI

- ADAMS, CLEVELAND L., Professor Emeritus, Textile Engineering, January, 1976. B.T.E., Auburn
- ALLEN, ROGER W., Dean Emeritus, Science and Literature, June, 1967. B.S., M.S., Auburn; M.S., Michigan; Ph.D., Columbia
- ALVORD, BEN FINLEY, Professor Emeritus, Research Data Analysis, June, 1966. B.S., M.S., Illinois
- ANSON, CHARLES P., Professor Emeritus, Economics and Geography, June, 1972. A.B., Wisconsin; M.A., Ohio State; Ph.D., N. Carolina
- APPLEBEE, FRANK W., Professor Emeritus, Art, August, 1969. Diploma, Massachusetts Art; B.S., M. App. Art, Auburn
- ANTHONY, W. B., Professor Emeritus, Animal and Dairy Science, March, 1980. B.S., Illinois; M.S., Texas A&M; Ph.D., Cornell

- ARANT, F. S., *Professor Emeritus, Zoology-Entomology, July, 1975. B.S., M.S., Auburn; Ph.D., Iowa State*
- AUTREY, K. M., *Professor Emeritus, Animal and Dairy Science, July, 1976. B.S., LSU; M.S., Ph.D., Iowa State*
- BARKSDALE, ROBBIE A., *Librarian III Emerita, July, 1976. A.B., Montevallo; B.S., M.S., Columbia*
- BEARD, G. W., *Director Emeritus, Athletics, June, 1972. B.S., Auburn*
- BENTLEY, CHARLES A., *Associate Professor Emeritus, Music, September, 1976. B.S.M., Baldwin-Wallace, M.A., Professional Diploma, "Specialist in Music Education," Ed.D., Columbia*
- BLACKSTONE, J. H., *Professor Emeritus, Agricultural Economics and Rural Sociology, April, 1977. B.S., M.S., Auburn*
- BOSTON, ROBERT O., *Associate Professor Emeritus, Economics, September, 1978. B.S., M.S., Alabama*
- BRITTIN, NORMAN A., *Professor Emeritus, English, June, 1977. A. B., A.M., Syracuse, Ph.D., Washington*
- BURNETT, PAUL C., *Professor Emeritus, Journalism, June, 1979. B.A., Louisiana Tech; M.A., LSU*
- CANTRELL, CLYDE HULL, *Director Emeritus, Libraries, July, 1977. A. B., M.A., A.B.L.S., N. Carolina; Ph.D., Illinois*
- CAPPS, JULIUS DANIEL, *Professor Emeritus, Chemistry, June, 1974. B.S., M.S., Auburn; Ph.D., Nebraska*
- CARTER, MARY F., *Professor Emerita, Architecture, June, 1980. A.B., Georgia; M.A., Columbia; Diploma, Parsons School of Design*
- COBB, CHARLES N., *Professor Emeritus, Ind. Engineering, December, 1970. B.S., Clemson; B.I.E., M.S., Auburn*
- COTTIER, G. J., *Professor Emeritus, Poultry Science, April, 1977. B.S., D.V.M., Auburn; M.A., Missouri*
- CURRENT-GARCIA, ALVA, *Associate Professor Emerita, Family and Child Development, September, 1978. A.B., Randolph-Macon; M.S., Nebraska*
- CURRENT-GARCIA, EUGENE, *Harris Professor Emeritus, English, January, 1979. A.B., M.A., Tulane; A.M., Ph.D., Harvard*
- DANNER, MAURICE, *Professor Emeritus, Ag. Ec. and Rural Soc., November, 1978. B.S., Texas Tech.; M.S., Tennessee*
- DAVIS, FRANK B., *Professor Emeritus, Speech Comm., June, 1974. B.A., Hendrix; M.A., Iowa; Ph.D., LSU*
- DAVIS, W. L., *Professor Emeritus, Education, July, 1975. B.S., Mid. Tenn. State; M.A., Peabody; Ed.D., Columbia*
- DECKER, HAROLD R., *Associate Professor Emeritus, Aerospace Engineering, January, 1979. B.S. Ed., NE Missouri State; M. Litt., Pittsburgh*
- DENDY, JOHN S., *Professor Emeritus, Zoology-Entomology & Fisheries & Allied Aquacultures, September, 1978. B.S., Presbyterian; M.A., N. Carolina; Ph.D., Michigan*
- DeVALL, WILBUR B., *Professor Emeritus, Forestry, February, 1978. B.S., New York State Forestry; M.S., Florida*
- EATON, W. H., *Associate Professor Emeritus, Dairy Husbandry, March, 1961. B.S., N. Carolina State*
- EDWARDS, CHARLES WESLEY, *Registrar Emeritus, June, 1966. B.S., Auburn; M.A., Harvard*
- ELLISOR, MILDRED R., *Professor Emerita, Elem. Ed., June, 1978. A.B., Huntington; M.A., Ed.D., Columbia*
- ENSMINGER, LEONARD E., *Professor Emeritus Agronomy and Soils, January, 1979. B.S., Missouri; Ph.D., Illinois*
- FORTENBERRY, CHARLES N., *Professor Emeritus, Political Science, July, 1979. B.A., M.A., Mississippi; Ph.D., Illinois*
- FOY, JAMES E., *Dean Emeritus, Student Affairs and Professor Emeritus, Counselor Education, April, 1978. A.B., M.A., Alabama; Ph.D., Michigan State*
- FRANCIS, ROBERT J., *Professor Emeritus, Health, Physical Education, and Recreation, September, 1977. A.B., Ohio Northern; M.A., Western Kentucky State; Ph.D., Ohio State*
- FRANCIS, WILLIAM HUGH, *Professor Emeritus, Technical Services, June, 1971. B.S., M.S., Auburn*
- FUNCHESS, LINWOOD E., *Director Emeritus, Buildings and Grounds, July, 1977. B.S., Auburn; M.S., Cornell*
- GARIN, GEORGE I., *Professor Emeritus, Forestry, June, 1972. B.S., M.S., Idaho; Ph.D., Yale*
- GLYDE, EDGAR C., *Professor Emeritus, Music, June, 1974. F.T.C.L., L.Mus.T.C.L., I.R.A.M., L.T.C.L. (London, England)*
- GOODMAN, JOHN G., *Associate Professor Emeritus, Poultry Science, August, 1973. B.S., M.S., Auburn*
- GOODWIN, GEORGE R., *Associate Professor Emeritus, Management, June, 1979. B.S., Florida; M.S., George Washington*
- GOSSER, LEO G., *Professor Emeritus, English, June, 1967. B.S., Kirksville State College; Ph.D., Chicago*
- HAINES, PAUL, *Professor Emeritus, English, July, 1975. B.S., Lafayette; M.A., Ohio Wesleyan; Ph.D., New York*
- HARRIS, HUBERT, *Associate Professor Emeritus, Horticulture, March, 1976. B.S., M.S., Auburn*
- HARTWIG, CHESTER W., *Professor Emeritus, Soc. and Anthro., January, 1977. B.S., M.A., Ph.D., Wisconsin*
- HAYNES, L. J., *Professor Emeritus, Tech. Services, Director Emeritus, Industrial Lab., October, 1978. B.S., M.S., Auburn; Ed.D., Bradley*
- HEATH, MCKENZIE, *Professor Emeritus, Small Animal Surgery and Medicine, July, 1968. D.V.M., Auburn*
- HOCKING, GEORGE M., *Professor Emeritus, Pharmacy, September, 1975. B.S.P., Washington; M.S.P., Ph.D., Florida*
- HODGKINS, EARL, *Professor Emeritus, Forestry, March, 1978. B.S., Michigan State; M.S., California; Ph.D., Michigan*
- HODSON, NORMA G., *Professor Emerita, Family and Child Development, September, 1976. B.S., Butler; M.S., Ph.D., Florida State*
- HOLLOWAY, OTTO, *Professor Emeritus, Found. of Ed., August, 1972. B.S., M.S., Auburn; Ed.D., Columbia*
- HUGHES, GORDON, *Professor Emeritus, Physics, June, 1970. B.A., Oberlin; M.A., Ph.D., Illinois*
- HUTSELL, WILBUR HALL, *Professor Emeritus, Athletic Department, June, 1963. A.B., Missouri*
- IKENBERRY, ERNEST, *Professor Emeritus, Mathematics, June, 1975. B.A., Ottawa; M.S., Kansas; Ph.D., LSU*
- INGRAM, W. T., *Business Manager and Treasurer Emeritus, June, 1973*
- INGRAM, FORNEY H., *Associate Professor Emeritus, Technical Services, June, 1972. B.S.C.E., M.C.E., Auburn*
- ISBELL, C. L., *Professor Emeritus, Horticulture, March, 1961. B.S., Auburn; M.S., Ph.D., Michigan State*
- IVEY, OLIVER T., *Professor Emeritus, History, August, 1969. B.S., M.S., Auburn; M.A., Chicago*
- JOHNSON, W. A., *Associate Professor Emeritus, Horticulture, January, 1975. B.S., M.S., Auburn*
- JONSON, W. C., *Asst. Director Emeritus, Eng. Experiment Station, July, 1977. B.S., U.S. Naval Academy*

- KINCEY, TRULY E., *Professor Emerita, Economics, September, 1979. A.B., Montevallo; M.A., Tulane; Ph.D., Ohio State*
- KING, DALE F., *Professor Emeritus, Poultry Science, July, 1967. B.S. Oregon State; M.S., Kansas State*
- KLONTZ, HAROLD E., *Professor Emeritus, Economics, June, 1979. A.B., Berea; Ph.D., N. Carolina*
- KNIGHT, W. CHARLES, *Professor Emeritus, Textile Engineering, July, 1976. B.T.E., Auburn; M.S.T.E., Georgia Tech*
- KRIBS, ANNA E., *Librarian III Emerita, September, 1976. A.B., Louisiana Tech; M.S.L.S., LSU*
- KUDERNA, JEROME, *Professor Emeritus, Education, June, 1962. B.S., M.A., Michigan State*
- KUMMER, FRED A., *Professor Emeritus, Agricultural Engineering, September, 1976. B.S.M.E., M.S., Auburn*
- LAMAR, MARY GEORGE, *Associate Professor Emerita, Management, September, 1974. B.S., Auburn; M.A., New York*
- LAND, JAMES E., *Professor Emeritus, Chemistry, June, 1975. B.S., Clemson; M.S., Tulane; Ph.D., N. Carolina*
- LAND, JEANNETTA T., *Professor Emerita, HPER, September, 1974. B.S., Alabama; M.A., Columbia*
- LANHAM, BEN T., JR., *Vice President Emeritus, January 1980. B.S., Clemson; M.S., Tennessee; Ph.D., Michigan State*
- LITTLE, ALTON S., *Associate Professor Emeritus, Tech. Svc., July, 1977. B.C.E., Auburn; M.S.C.E., Georgia Tech*
- LIVERMAN, JOHN HUBERT, *Professor Emeritus, Music, June, 1980. B.S., M.A., Columbia*
- LIVINGSTON, KNOX, *Associate Professor Emeritus, Forestry, January, 1978. B.S., S. Carolina; M.F., Duke*
- LYLE, JAMES A., *Professor Emeritus, Botany and Microbiology, October, 1979. B.S., Kentucky; M.S., N. Carolina State; Ph.D., Minnesota*
- MARTY, EDWARD C., *Professor Emeritus, Building Technology, June, 1972. B.Arch., M.Arch., Auburn*
- MAYNOR, HAL W., JR., *Professor Emeritus, Mechanical Engineering, October, 1978. B.S., M.S., D. of Engr., Kentucky*
- McCLUNG, JAMES D., *Associate Professor Emeritus, Engineering Graphics and Technical Services, June, 1979. B.S., Ed M., Oklahoma*
- McINTYRE, SHERWOOD C., *Professor Emeritus, Psychology, January, 1977. B.A., B.Sc., M.A., Ph.D., Ohio State*
- MCLEOD, FRANCES R., *Associate Professor Emerita, English, July, 1975. A.B., Huntingdon; M.S., Auburn*
- McMILLAN, M. C., *Hollifield Professor Emeritus, History, January, 1978. A.B., M.A., Alabama; Ph.D., N. Carolina*
- METZGER, A. B., *Associate Professor Emeritus, Political Science, August, 1974. B.B.A., Chattanooga; M.A., Auburn*
- MONTGOMERY, ROBERT W., *Professor Emeritus, Vocational and Adult Education, July, 1980. B.S., M.S., Auburn; Ph.D., Ohio State*
- MOORE, E. B., JR., *Professor Emeritus, Ed. Administration, September, 1978. A.B., M.B.A., Syracuse; Ed.D., Florida*
- MOORE, JOHN RICHARD, *Professor Emeritus, English, 1964. A.B., Tulane; A.M., Ph.D., Harvard*
- MOORE, OMAR C., *Associate Professor Emeritus, Chemical Engineering, September, 1969. B.S., M.S., Auburn*
- MYLES, WILLIAM R., *Associate Professor Emeritus, Management, September, 1977. B.S., M.A., Pittsburgh*
- NEAL, JAMES E., *Professor Emeritus, Microbiology, December, 1971. B.S., Miss. State; D.V.M., Auburn; M.S., Texas A&M*
- NEAL, JESSE H., *Professor Emeritus, Ag. Eng., August, 1967. B.S., Kansas State; M.S., Minnesota; Ph.D., Missouri*
- NEWELL, ANNE LAURA, *Professor Emerita, Elementary Education, June, 1980. A.B., LaGrange; M.S., Ed.D., Auburn*
- NICHOLS, GROVER TYLER, *Associate Professor Emeritus, Elect. Eng., December, 1973. B.E.E., Auburn; M.S., Georgia Tech*
- NICHOLS, JR., SAMUEL HARDING, *Professor Emeritus, Chemistry, June, 1974. A.B., Centre; M.S., Ph.D., Ohio State*
- ORR, FRANK MARION, *Professor Emeritus, Building Technology, June, 1971. B.S., M.Arch., Auburn*
- OTTIS, KENNETH, *Professor Emeritus, Zoo-Ent., June, 1973. B.S., Dakota Wesleyan; M.S., Ph.D., Iowa State*
- PARKER, WILLIAM V., *Dean Emeritus of the Graduate School and Professor Emeritus, Mathematics, June, 1972. A.B., M.A., N. Carolina; Ph.D., Brown*
- PATRICK, WALTON R., *Hargis Professor Emeritus, English, January, 1978. B.S., Miss. State; M.A., Ph.D., LSU*
- PEARSON, ALLEN M., *Professor Emeritus, Zoo-Ent., December, 1971. B.S., Auburn; M.S., Ph.D., Iowa State*
- PEET, HELEN H., *Librarian III Emerita, July, 1976. B.A., Mississippi Woman's College; M.A., Tulane*
- PERRY, NORMAN, *Professor Emeritus, Mathematics, September, 1977. A.B., California; M.A., Ph.D., Georgia*
- PHILPOTT, HARRY M., *President Emeritus, June, 1980. A.B., Washington and Lee; Ph.D., Yale; D.D. (Hon.), Stetson; LL.D. (Hon.), Washington and Lee; LL.D. (Hon.), Florida; LL.D. (Hon.), Alabama; M.H.D. (Hon.) Samford*
- PIERCE, TRUMAN M., *Dean and Professor Emeritus, Education, July, 1976. Ph.B., Piedmont; M.A., Alabama; Ph.D., Columbia*
- PITTS, ROBERT G., *Professor Emeritus, Aerospace Engineering, July, 1979. B.A.E., Auburn; M.S., California Tech*
- POSEY, HENRY G., *Associate Professor Emeritus, Forestry, July, 1978. B.S.F., M.S.F., N. Carolina State*
- PUMPHREY, FRED H., *Dean Emeritus, School of Engineering, June, 1969. B.S., B.E.E., E.E., D.Sc. (hon.), Ohio State*
- PUNKE, HAROLD H., *Professor Emeritus, Foundations of Education, June, 1971. B.S., M.S., Illinois; Ph.D., Chicago*
- RASH, JOE M., *Associate Professor Emeritus, Pharmacy, January, 1975. B.S., Carson-Newman; M.S., Auburn*
- REAGAN, HUGH D., *Associate Professor Emeritus, History, June, 1980. B.A., M.A. Emory; Ph.D., Texas*
- RITCHIE, VIRGINIA CORBIN, *Associate Professor Emerita, Home Economics, June, 1966. B.S., M.S., Kentucky*
- ROBERTS, CHARLES S., *Professor Emeritus, Pathology and Parasitology, August, 1977. D.V.M., Auburn; M.S., Michigan State*
- ROBERTSON, FRED R., *Vice President Emeritus, Extension and Professor Emeritus, Political Science, June, 1978. B.S., M.S., Tennessee; Dr.P.A., Harvard*
- ROBINSON, A. JUDE, *Associate Professor Emeritus, Mathematics, June, 1967. B.S., Clemson; M.A., Emory*
- ROGERS, HOWARD T., *Professor Emeritus, Agronomy and Soils, April, 1976. B.S., Va. Tech; M.S., Michigan State; Ph.D., Iowa State*
- ROLLO, CHARLES A., *Associate Professor Emeritus, Agricultural Engineering, August, 1978. B.S., M.S., Auburn*
- SARVER, JOSEPH B., *Executive Secretary Emeritus, the Alumni Association and Director Emeritus of the Auburn Development Program, November, 1976. B.S., Auburn*
- SAUNDERS, CHARLES RICHARD, *Dean Emeritus, School of Chemistry, July, 1969. B.S., M.S., Auburn; Ph.D., Nebraska*

- SCARSBROOK, CLARENCE E.**, *Professor Emeritus, Agronomy and Soils, October, 1978. B.S., Auburn; Ph.D., N. Carolina State*
- SCHELL, FRED G.**, *Professor Emeritus, Large Animal Surgery and Medicine, February, 1974. D.V.M., Auburn*
- SHERLING, WILLIAM G.**, *Associate Professor Emeritus, Aerospace Engineering, October, 1980. B.A.E., Auburn; M.S.A.E., Georgia Tech*
- SIMMONS, CHARLES F.**, *Dean Emeritus, School of Agriculture and Assistant Director Emeritus, Agricultural Experiment Station, June, 1980. B.S., M.S., Auburn, Ph.D., Ohio State*
- SMITH, E. V.**, *Dean Emeritus, Agriculture and Director Emeritus of the Agricultural Experiment Station, June, 1972. B.S., Auburn; M.S., Ph.D., Iowa State*
- SMITH, WILLIAM S.**, *Professor Emeritus, Speech Comm., September, 1977. B.Ed., N. Illinois; M.A., Ph.D., Stanford*
- SPANN, RANSOM D.**, *Professor Emeritus, Electrical Engineering, June, 1964. B.S.E.E., E.E., Auburn*
- SPEER, WILLIAM A.**, *Professor Emeritus, Architecture, June, 1980. B.S. Arch., Clemson, M.Arch., Rensselaer Tech*
- SPIDLE, MARION WALKER**, *Dean Emerita, Home Economics, June, 1966. B.S., Alabama; B.S., M.A., Columbia*
- STALNAKER, CARROLL C.**, *Associate Professor Emeritus, Accounting and Finance, September, 1973. B.A., Iowa State; M.A., Iowa*
- STOKES, CHARLIE MACK**, *Associate Professor Emeritus, Agricultural Engineering, March, 1980. B.S., M.S., Auburn*
- STURKIE, D. G.**, *Professor Emeritus, Agronomy and Soils, July, 1968. B.S., Auburn; M.S., Iowa State; Ph.D., Michigan State*
- SYKES, MALTBY**, *Professor Emeritus, Art, June, 1977. Studied with Wyman Adams, Diego Riviera, John Sloan, George C. Miller, Fernand Leger, Stanley William Hayter, and Andre Lhote*
- THOMPSON, SIDNEY LEE**, *Associate Professor Emeritus, Mathematics, June, 1976. B.S., Birmingham-Southern; M.S., Tulane; M.A., Michigan*
- TURNER, LOUISE K.**, *Associate Professor Emerita, HPER, September, 1975. B.A., SW University; M.A., M.S., LSU; Ph.D., New York*
- TURNER, DEWEY M.**, *Associate Professor Emeritus, Animal and Dairy Sciences, December, 1972. B.S., Auburn; M.S., Illinois*
- UMBACH, A. W.**, *Professor and Wrestling Coach Emeritus, August, 1973. B.S., SW State Teachers; M.A., Colorado State Education*
- VALLERY, H. F.**, *Assistant to the President Emeritus, July, 1979. B.A., M.A., LSU; M.A., Ed.D., Columbia*
- VAN DE MARK, MILDRE S.**, *Professor Emerita, Home Economics, March, 1973. B.S., Auburn; M.S., Columbia*
- WALL, MINNIE**, *Librarian III Emerita, July, 1978. A.B., Tift, B.S.L.S., Peabody, M.Ed., Auburn*
- WARD, BENJAMIN P.**, *Associate Professor Emeritus, Mech. Eng., July, 1968. B.S., U.S. Naval Academy; M.S.M.E., Columbia*
- WARREN, W. M.**, *Professor Emeritus, Animal and Dairy Sciences, September, 1980. B.S., Michigan State; M.S., Texas A&M, Ph.D., Missouri*
- WHITE, RAYMOND H.**, *Professor Emeritus, Education, April, 1965. B.S., SW Missouri; A.B., Drury; A.M., Chicago; Ed.D., Columbia*
- WILLIAMS, ERNEST**, *Professor Emeritus, Mathematics, June, 1976. B.S., Birmingham-Southern; M.S., Auburn; Ph.D., Michigan*
- WINGARD, ROBERT EUGENE**, *Professor Emeritus, Chemical Engineering, October, 1974. B.S., M.S., Auburn*
- YOUNG, LUTHER M.**, *Associate Professor Emeritus, HPER, January, 1977. B.S., M.S., Auburn*

STATE REGULATORY AND VETERINARY SERVICES

STATE REGULATORY SERVICE

CHEMISTRY

GUTHERY, MILFORD DALTON, *Director*, 1966, 1972. B.S., M.S., Auburn
HAYES, MELVIN, *Agricultural Chemist II*, 1966, 1968. B.S., West Virginia
HAYES, ROSE MAE, *Agricultural Chemist II*, 1967, 1973. B.S., N. Alabama
OWEN, MARJORIE E., *Agricultural Chemist I*, 1972. B.S., N. Alabama
JINKS, JOHN D., *Chemist II*, 1968. B.S., Auburn
BOULWARE, PAUL, *Chemist I*, 1970 B.S., M.S., Auburn
ADCOCK, BOBBY W., *Assistant Chemist*, 1975. B.S., Auburn

STATE VETERINARY DIAGNOSTIC LABORATORY

(Conducted in cooperation with the Alabama State Department of Agriculture and Industries and the United States Department of Agriculture, Agricultural Research Service.)

VAUGHAN, JOHN T., *Dean (School of Veterinary Med.)* 1974, 1977. D.V.M., M.S., Auburn
MITCHELL, FRANK, *Assistant State Veterinarian & Director (State Diagnostic Laboratory)*, 1947, 1963. D.V.M., Auburn; M.S., Michigan State
ELLIS, ALFRED C., *Microbiologist (State Diagnostic Laboratory)*, 1973. B.S., Jacksonville State; M.S., Samford
CHRISTENBERRY, C.C., *Brucellosis Epidemiologist (U.S. Dept. of Agriculture, Agricultural Research Service)*, 1966. B.S., D.V.M., M.S., Auburn
MILLER, T.M., *Director of State Veterinary Diagnostic Laboratory, Elba, Alabama*, 1960. D.V.M., Auburn

AGRICULTURAL EXPERIMENT STATION STAFF¹

- FUNDERBURK, H. HANLY, JR., *President*. B.S., M.S., Auburn; Ph.D., LSU
 WILSON, STANLEY P., *Vice President for Agriculture, Home Economics, and Veterinary Medicine*. B.S., M.S., Auburn; Ph.D., Oklahoma State
 BUCHANAN, GALE A., *Dean for Research and Director of the Agricultural Experiment Station*. B.S., M.S., Florida; Ph.D., Iowa State
 CORLEY, TOM. E., *Assistant Dean and Assistant Director of the Agricultural Experiment Station*. B.S., M.S., Auburn
 BRUCE, CHARLES W., *Assistant to the Director of the Agricultural Experiment Station*. B.S., N. Alabama; M.S., Auburn
 SMITH, EDWIN V., *Director Emeritus of the Agricultural Experiment Station*. B.S., Auburn; M.S., Ph.D., Iowa State

AGRICULTURAL ECONOMICS AND RURAL SOCIOLOGY

- YEAGER, J. H., *Professor and Head of Department*, 1951, 1964. B.S., M.S., Auburn; Ph.D., Purdue
 BELL, S. C., *Professor*, 1956, 1971. B.S., M.S., Auburn; Ph.D., Michigan State; J.D., Jones Law
 JOLLY, C. M., *Assistant Professor*, 1980. B.S., Tuskegee; M.S., Auburn; Ph.D., LSU
 WHITE, MORRIS, *Professor*, 1950, 1960. B.S., Auburn; M.S., Ph.D., Purdue
 WILSON, L. E., *Professor*, 1960, 1968. B.S., Murray State; M.S., Kentucky; Ph.D., Illinois
 ADRIAN, JOHN L., JR., *Associate Professor*, 1979. B.A., M.S., Auburn; Ph.D., Tennessee
 CLONTS, HOWARD A., JR., *Professor*, 1962, 1973. B.S., M.S., Auburn; Ph.D., Va. Tech
 DUNKELBERGER, J. E., *Associate Professor*, 1962, 1967. A.B., Franklin and Marshall; M.S., Penn. State; Ph.D., Mississippi State
 MCCOY, EDWARD W., *Associate Professor*, 1967, 1972. B.S., M.S., Nevada; Ph.D., Tennessee
 STALLINGS, JAMES L., *Associate Professor*, 1969. B.S., M.S., Purdue; Ph.D., Michigan State
 HARDY, WILLIAM E., JR., *Associate Professor*, 1972, 1977. B.S., M.S., Ph.D., Va. Tech
 MARTIN, NEIL R., JR., *Associate Professor*, 1977. B.S., M.S., Auburn; Ph.D., Illinois
 *ADAMS, MURRAY, JR., *Associate Professor (Sociology & Anthropology)*, 1964, 1970. B.A., M.A., Mississippi; Ph.D., Kentucky
 MOLNAR, JOSEPH J., *Assistant Professor*, 1976. B.A., M.A., Kent State; Ph.D., Iowa State
 SULLIVAN, GREGORY M., *Assistant Professor*, 1979. B.A., Notre Dame, M. Agr., Ph.D., Texas A&M
 VANLANDINGHAM, CALVIN L., *Assistant Professor*, 1968. B.A., Millsaps; M.A., Ph.D., Mississippi State
 LICHTKOPPLER, RICHARD J., *Research Associate*, 1978. B.S., M.S., Ohio State
 THOMAS, JOSEPH G., JR., *Research Associate*, 1977. B.S., Mississippi State; M.S., Kansas State
 BARNES, T. A., *Research Associate*, 1980. B.S., Auburn
 GALBREATH, P. F., *Research Associate*, 1980. B.S., Wooster; M.S., Auburn

AGRICULTURAL ENGINEERING

- TURNQUIST, P. K., *Professor and Head of Department*, 1977. B.S., Kansas State; M.S., Ph.D., Oklahoma State
 JOHNSON, C. E., *Professor*, 1979. B.S., Oklahoma State; M.S., Ph.D., Iowa State
 RENOLL, E. S., *Professor*, 1949, 1972. B.S., Auburn; M.S., Iowa State
 BUSCH, CHARLES D., *Associate Professor*, 1969. B.S., Cornell; M.S., Utah State; Ph.D., Cornell
 DUMAS, W. T., *Associate Professor*, 1946, 1962. B.S., M.S., Auburn
 HILL, D. T., *Associate Professor*, 1979. B.S., M.S., Georgia; Ph.D., Clemson
 FLOOD, C. A., JR., *Associate Professor*, 1971, 1979. B.S., Florida; M.S., Kentucky; Ph.D., Purdue
 KOON, JOE L., *Associate Professor*, 1967, 1975. B.S., M.S., Ph.D., Auburn
 ROCHESTER, E. W., JR., *Associate Professor*, 1970, 1978. B.S., Clemson; M.S., Ph.D., N. Carolina State
 LEATHERMAN, DAVID R., *Research Associate*, 1979. B.S., Auburn
 OAKES, P. L., *Research Associate*, 1978. B.S., Auburn
 YOUNG, S. C., *Research Associate*, 1977. B.S., Clemson
 BAILEY, A. C., *Agricultural Engineer (Coop. USDA)*, 1965. B.S., Michigan State; M.S., Illinois; Ph.D., Auburn

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 LISANO, M. E., *Associate Professor*, 1980. B.S., M.S., Sam Houston; Ph.D., Texas A&M
 BRADLEY, JAMES T., *Assistant Professor*, 1976. B.S., Wisconsin; Ph.D., Washington
 CLARK, WAYNE E., *Assistant Professor*, 1978. B.S., M.S., Brigham Young; Ph.D., Texas A&M
 ESYES, PAUL M., *Assistant Professor*, 1966. B.Sc., Purdue; Ph.D., California
 GAYLOR, MICHAEL J., *Assistant Professor*, 1978. B.S., M.S., Auburn; Ph.D., Texas A&M
 HILL, EDWARD P., III, *Assistant Professor*, 1967, 1974. B.S., Oregon State; M.S., Ph.D., Auburn
 MULLEN, GARY R., *Assistant Professor*, 1975. B.A., Northeastern; Ph.D., Cornell
 HERBERT, D. A., *Research Associate*, 1979. B.S., Johnson State; M.S., Auburn
 MUEHLEISEN, DAVID P., *Research Associate*, 1978. B.S., M.S., Clemson
 ROHLFS, WALTER M., *Research Associate*, 1979. B.S., Ursinus; M.S., Auburn

SUBSTATIONS AND FIELDS

Black Belt—Marion Junction, Dallas County

SMITH, L. A., *Superintendent*, 1951, 1957. B.S., Auburn
 GRIMES, HAROLD W., JR., *Associate Superintendent*, 1955, 1978. B.S., M.S., Auburn
 HOLLIMAN, JAMES LOUIS, *Assistant Superintendent*, 1975. B.S., M.S., Mississippi State

Chilton Area Horticulture—Clanton, Chilton County

CARLTON, C. C., *Superintendent*, 1948. B.S., Auburn
 SHORT, KENNETH C., *Assistant Superintendent*, 1960. B.S., Auburn

Gulf Coast—Fairhope, Baldwin County

CARDEN, EMMETT L., *Superintendent*, 1969, 1978. B.S., M.S., Auburn
 McDANIEL, N. R., *Associate Superintendent*, 1969, 1978. B.S., M.S., Auburn
 SELMAN, FRANK B., *Assistant Superintendent*, 1975. B.S., M.S., Mississippi State

Lower Coastal Plain—Camden, Wilcox County

LITTLE, JOE A., *Superintendent*, 1959, 1975. B.S., Western Kentucky State; M.S., Auburn
 WATSON, W. J., *Assistant Superintendent*, 1958. B.S., Auburn
 DELANEY, D. P., *Assistant Superintendent*, 1980. B.S., Michigan State; M.S., Clemson

North Alabama Horticulture—Cullman, Cullman County

HOLLINGSWORTH, M. H., *Superintendent*, 1958, 1962. B.S., Auburn

Piedmont—Camp Hill, Tallapoosa County

GRIFFEY, W. A., *Superintendent*, 1972, 1973. B.S., M.S., Tennessee
 BURGESS, HOYT E., *Associate Superintendent*, 1967, 1979. B.S., Auburn

Sand Mountain—Crossville, DeKalb County

EASON, J. T., *Superintendent*, 1966, 1974. B.S., M.S., Auburn
 RUF, M. E., *Associate Superintendent*, 1976. B.S., M.S., Auburn

Tennessee Valley—Belle Mina, Limestone County

WEBSTER, W. B., *Superintendent*, 1958, 1977. B.S., M. of Agri., Auburn
 CALVERT, VAUGHN H., II, *Assistant Superintendent*, 1978. B.S., Georgia; M.S., N. Carolina State

Upper Coastal Plain—Winfield, Fayette & Marion Counties

MOORE, ROBERT A., JR., *Superintendent*, 1959, 1969. B.S., M. of Agri., Auburn

Wiregrass—Headland, Henry County

STARLING, J. G., *Superintendent*, 1948, 1972. B.S., Auburn

IVEY, HENRY W., *Associate Superintendent*, 1960, 1978. B.S., Auburn

Ornamental Horticulture Field Station—Spring Hill, Mobile County

SELF, R. L., *Plant Pathologist, In-charge*, 1942, 1952. B.S., M.S., Auburn; Ph.D., Wisconsin

COBB, GARY S., *Assistant Superintendent*, 1978. B.S.A., Georgia; M.S., Colorado State

Brewton & Monroeville Fields—Escambia & Monroe Counties

PITTS, JAMES A., *Superintendent (Brewton)*, 1979. B.S., M.S., Auburn

Prattville Field—Autauga County

GLAZE, FRED T., *Superintendent (Prattville)*, 1954, 1969. B.S., Auburn

ALABAMA COOPERATIVE EXTENSION SERVICE STAFF

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SPROTT, J. MICHAEL, *Dean for Extension & Director, ACES*. 1975. B.S., M.S., Arkansas; Ph.D., Texas A&M
CAVENDER, A. RAY, *Assoc. Dean for Extension & Assoc. Director, ACES*. 1958, 1975. B.S., M.S., Tennessee; Ph.D., Wisconsin
BUFORD, JAMES A., *Head, Management Operations*, 1965, 1975. B.S., M.S., Auburn; Ph.D., Georgia
ELLIOTT, THOMAS R., *Head, Administrative Services*, 1970, 1979. B.S., Austin Peay; M.Ed., Ed.D., Auburn
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SMITH, JAMES L., *Head, Personnel & Staff Development*, 1965, 1975. B.S., Edward Waters; M.S., Tuskegee; Ph.D., Ohio State
STRICKLAND, ELMER OSCAR, *Head, Program Development*, 1961, 1976. B.S., M.Ag. Ed., Auburn; Ed.D., LSU
HOLSENBECK, DANIEL C., *Director, University Relations*, 1980. B.S., Auburn; M.S., Johns Hopkins; Ph.D., Florida State

AGRICULTURE AND NATURAL RESOURCES

Extension Agricultural Economics

MADDOX, CHARLES L., *Head, Extension Agricultural Economics*, 1954, 1976. B.S., M.S., Auburn
BOUTWELL, JOHN L., *Economist - Pest Management*, 1976. B.S., M.S., Auburn
CREWS, JERRY R., *Economist-Livestock Farm Management*, 1978. B.S., M.S., Georgia
HENSHAW, DOUGLAS M., *Economist-Farm Management*, 1978. B.S., M.S., Kentucky
HUDDLESTON, N. RAY, *Economist-Marketing Firms*, 1968, 1976. B.S., Tennessee Tech; M.S., Tennessee; Ph.D., Mississippi State
HURST, JAMES R., *Economist - Crops Marketing*, 1977. B.S., M.S., Auburn; J.D., Jones Law
JOHNSON, JAMES LAVAUGHN, *Economist-Crops Management*, 1978. B.S., M.S., Auburn; Ph.D., Kentucky
LINTON, DANIEL A., *Economist-Livestock Marketing*, 1962. B.S., M.S., Auburn
ROBERTS, LARRY, (*Decatur*) *Economist - Farm Management*, 1960, 1977. B.S., M.S., Auburn
WILLIAMS, JOHN LOUIS, *Economist-Horticulture*, 1978. B.S., M.S., Clemson; Ph.D., Miss. State
THOMPSON, NOEL A.D., *Extension Program Associate-Data Analyst*, 1980. B.S., Jackson State; M.S., Tuskegee
YOUNG, GEORGE J., *Economist-Farm Business Management*, 1980. B.S., M.S., Illinois

Extension Agricultural Engineering

OGBURN, CHARLES, *Head Extension Agricultural Engineering*, 1977. B.S., M.S., Virginia Tech; Ph.D., Auburn
CURTIS, LARRY, *Agricultural Engineer-Soil, Water and Safety*, 1976. B.S., M.S., Auburn
DONALD, JAMES O., *Agricultural Engineer-Processing*, 1976. B.S.A.E., M.S.A.E., Georgia
MAYFIELD, WILLIAM D., *Agricultural Engineer-Machinery*, 1971, 1976. B.S., Tennessee; M.S., Mississippi State
WATSON, HAROLD, *Agricultural Engineer Structures & Environment*, 1966, 1976. B.S., M.S., LSU
COOK, JOHN A., *Extension Program Associate-Energy*, 1980. B.S., M.S., Miss. State

Agronomy

CHAPMAN, LOUIE P., *Head, Extension Agronomy*, 1967, 1976. B.S., M.S., Auburn; Ph.D., Florida
BALL, DONALD M., *Agronomist-Pastures and Forages*, 1976. B.S., Western Kentucky; M.S., Ph.D., Auburn
BURDETT, ROBERT A., *Agronomist-Seeds*, 1968. B.S., M.S., Auburn; Ph.D., Mississippi State
EICH, SAM M., (*Decatur*) *Agronomist*, 1957, 1968. B.S., M.Ag., Auburn
HOYUM, RAYMOND A., *Agronomist-Soils*, 1978. B.S., Wisconsin; M.S., Ph.D., Auburn
HARTZOG, DALLAS, (*Headland*) *Agronomist-Peanuts*, 1976. B.S., M.S., Auburn
HENDERSON, JOHN B., *Agronomist-Soybeans*, 1960, 1969. B.S., M.S., Auburn; Ph.D., North Carolina State
LINK, J. G., (*Decatur*) *Agronomist*, 1959, 1976. B.S., M.S., Auburn
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Natural Resources

- WADE, LARKIN H., *Head, Extension Natural Resources*, 1965, 1976. B.S.F., M.S., Auburn
 HOLEMO, FRED, *Forester-Demonstrations*, 1976. B.S., Michigan State; M.S., Purdue; Ph.D., Georgia
 JENSEN, JOHN, *Fisheries Specialist*, 1979. B.S., Minnesota; M.S., Ph.D., Auburn

Pest Management

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 COBB, PATRICIA P., *Entomologist*, 1978. B.S. Huntingdon; M.S., Ph.D., Auburn
 DENNIS, CARL, *Apiculturist*, 1954, 1968. B.S., M. Ag., Auburn
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 EVEREST, JOHN W., *Weed Specialist*, 1978. B.S., Alabama; M.S., Ph.D., Auburn
 GAZAWAY, WILLIAM S., *Plant Pathologist and Nematologist*, 1976. B.S., Mississippi State; Ph.D., Texas A&M
 HAGAN, AUSTIN K., *Plant Pathologist and Nematologist*, 1980. B.S., Indiana U. of Pennsylvania; M.S., Ph.D., Ohio State
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 SMITH, RONALD H., *Entomologist*, 1972. B.S., M.S., Ph.D., Auburn
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 WEEKS, JAMES R., (*Headland*) *Pest Management Specialist*, 1978. B.S., M.S., Auburn
 WHITWELL, TED, (*Decatur*) *Weed Scientist*, 1977. B.S., Tennessee; M.S., Ph.D., Oklahoma State
 WORLEY, GLENN, (*Seima*) *Entomologist-Cotton*, 1976. B.S., Louisiana State; M.S., Arkansas

Animal Science

- McGUIRE, ROBERT LEE, *Head, Extension Animal Science*, 1974, 1976. B.S., M.S., North Carolina State; Ph.D., Kentucky
 BARNES, WILLIAM, *Animal Scientist-Dairy*, 1976. B.S., Arizona State; M.S., North Carolina State; Ph.D., Pennsylvania State
 BLAYLOCK, ROBERT E., (*Decatur*) *Animal Scientist*, 1976, 1979. B.S., M.S., Mississippi State
 DANION, JAMES R., *Animal Scientist-Swine*, 1960, 1976. B.S., M.S., Georgia; Ph.D., Auburn
 DEESE, RICHARD E., *Animal Scientist-Beef*, 1965, 1976. B.S., M.S., Mississippi State; Ph.D., Florida
 ECKMAN, MICHAEL., *Poultry Pathologist*, 1977. B.A., M.A., N. Colorado; Ph.D., Auburn
 GIMENEZ, DIEGO M., (*Selma*) *Animal Scientist*, 1978. B.S., M.S., Ph.D., Florida
 JONES, WILLIAM R., *Food Scientist-Meats*, 1975, 1976. B.S., Mississippi State; M.S., Ph.D., Virginia Tech
 KJAR, HAROLD A., *Extension Veterinarian*, 1978. D.V.M., Iowa State
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Horticulture

- HAGLER, T. B., *Head, Extension Horticulture*, 1960, 1976. B.S., M.S., Auburn; Ph.D., Maryland
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 POUNDERS, CECIL T., (*Decatur*) *Horticulturist*, 1978. B.S., Auburn; M.S., Minnesota
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 SMITH, PERRY M., *Horticulturist-Vegetables*, 1966, 1976. B.S., Clemson; M.S., North Carolina State
 SHEFFER, KIM M., *Horticulturist-Turf and Home Grounds*, 1980. B.S., M.S., Penn. State; Ph.D., Missouri

HOME ECONOMICS

- TATE, DOROTHY E., *State Leader-Home Economics*, 1976, 1980. B.S., M.S., Penn. State; Ed.D., N. Carolina State

Family Living

- PETERS, RUSSEL, *Head, Extension Family Living*, 1976. B.A., Greenville; M.A., Ph.D., Indiana
 ANDERSON, LENDA JO, *Home Economist-Clothing*, 1976. B.S., Louisiana Tech; M.S., LSU
 AYCOCK, GEORGIA, *Home Economist-Home Furnishing*, 1974, 1976. B.S., M.Ed., Auburn
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Food and Nutrition

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JACKSON, YVONNE, *Nutrition Specialist*, 1978. B.S., Wyoming; M.S., North Carolina; Ph.D., Tennessee
GOEBEL, VIRGINIA, *Home Economist - EFNEP Program Analyst*, 1969, 1977. B.S., M.S., Ed.S., Auburn
PRICKETT, FARISS, *Home Economist-Foods and Nutrition*, 1955, 1978. B.S., M.S., Auburn
REYNOLDS, SUSAN, *Home Economist - Food and Nutrition*, 1977. B.S., Tennessee Tech; M.S., Tennessee

Health Education

MASON, RUTH, (*Gadsden*) *Health Educator*, 1978. B.S.N., Alabama
MORGAN, MARYLOU J., *Health Educator*, 1980. A.B., Wake Forest; M.S., Ed.D., Tennessee

4-H AND YOUTH

MAYFIELD, CECIL, *State 4-H Club Leader*, 1955, 1970. B.S., M.S., Auburn; Ed.D., LSU
BARR, ANN, *State 4-H Club Leader*, 1945, 1976. B.S., Montevallo
CHERELLIA, BARBARA, *4-H Leadership Specialist*, 1958, 1976. B.S., N. Alabama; M.Ed., LSU; Ed.S., Auburn
DOZIER, L. A., *4-H Specialist-ANR*, 1964, 1978. B.S., M.Ed., Ph.D., Auburn
JONES, BERTHA M., *State Leader Urban 4-H & EFNEP Youth*, 1945, 1978. B.S., Alabama A&M; M.Ed., Penn State
STABLER, DEBORAH H., *4-H Specialist-Educational Aids & Information*, 1978. B.A., Troy State; M.A., Alabama

COMMUNITY RESOURCE DEVELOPMENT

MCCORD, R. WARREN, *State Leader, Community Resource Development*, 1972, 1976. B.S., North Alabama; M.S., Ph.D., Auburn
CLARK, ROBERT, *Community Development Specialist- Recreation & Tourism*, 1954, 1976. B.S., M.S., Auburn
HOSKING, WILLIAM, (*Mobile*) *Extension Economist - Marine Resources*, 1977. B.S., M.S., Ph.D., Georgia
LEE, V. WILSON, *Economist-Community Resource Devel.*, 1965, 1976. B.S., Auburn; M.S., Arizona
LORBER, MICHAEL D., *CRD Specialist-Land Use and Water Resources*, 1978. B.S., Iowa State; M.A., Florida
RAWSON, MAC, (*Mobile*) *Coordinator, Marine Resources and Advisory Services*, 1976, 1980. B.S., M.S., Auburn; Ph.D., Georgia
STRAWN, HARRY B., *Economist-Resource Development*, 1969, 1978. B.S., North Carolina; M.S., Ph.D., Tennessee
TIDWELL, MACON B., (*Selma*) *Community Development Specialist*, 1957, 1976. B.S., M. Ag., Auburn
WILSON, WILLIAM E., *Community Development Specialist*, 1954, 1976. B.S., M. Ag., Auburn

INFORMATION SERVICES

PARROTT, JOHN L., *Head, Information Services*, 1959, 1976. B.S., M.Ed., Auburn
ALLEN, JAMES, JR., *Information Specialist-Publications*, 1978. B.A., M.A., Florida
BROWN, ALEX C., *Information Specialist-Visuals*, 1959, 1976. B.S., Tuskegee; M.S., Indiana
BROWNING, NED, *Information Specialist-Radio*, 1978. B.A., MSC, Auburn
CANNON, LENA, *Information Specialist-Home Economics*, 1948, 1976. M.S., West Virginia
STEIN, RUTH R., *Information Specialist-Art*, 1978. B.F.A., Auburn; M.F.A., Syracuse
STRAIN, W. L., *Assistant Head, Information Services*, 1955, 1976. B.S., M.Ed., Tuskegee; M.S., Wisconsin
SMITH, JACK D., *Coordinator, Mass Media*, 1962, 1976. B.A., Auburn; M.S., Alabama
WILLIAMS, G. ELBERT, *Coordinator-Publications, Art and Visuals*, 1960, 1976. B.S., M.Ed., Auburn
CHENEY, WALTER K., *Information Specialist-Art*, 1958, 1976. B.A.A., M.S., Auburn
COPELAND, KENNETH J., *Information Specialist-Print Media*, 1957, 1976. B.S., M. Ag., Ed., Auburn
THORNTON, NANCY H., *Information Specialist-Publications*, 1970, 1976. B.A.A., M.Ed., Auburn
YERBY, LLOYD, *Information Specialist-Television*, 1974, 1976. B.S., M.A., Alabama
HAMBLEY, RICHARD, *Extension Program Associate-Visual Design*, 1975, 1980. B.F.A., Auburn

OTHER STAFF

BROWN, GRACE F., *Administrative Assistant*, 1958, 1966
GOLDEN, MILDRED, *Financial Records Assistant*, 1969, 1979.
HAMMOND, LYNNE, *Personnel Specialist*, 1977
PAYNE, SHIRLEY C., *Personnel Specialist*, 1977

CREWS, KAREN M., *Ext. Prog. Assoc.-Adm. Serv.*, 1977, 1980. B.S., LaGrange
TEAGUE, RALPH, J., *Management Info. Spec.*, 1971, 1977. B.S., Auburn

DISTRICT I (Decatur)

SUPERVISORY STAFF

Explanation of abbreviations listed below:

CRD—Community Resource Development

ANR—Agriculture and Natural Resources

HE—Home Economics

E. JEWELL COATS, *District Agent-ANR*, 1966, 1976. B.S., Western Kentucky; M.S., Auburn; Ed.S., Miss. State
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HERMAN H. MARKS, *District Agent-CRD*, 1954, 1976. B.S., M.Ag.Ed., Ed.S., Auburn
CLARENCE H. McDANIEL, *District Agent-Special Programs*, 1954, (District I & II), 1976. B.S., M.S., Alabama A&M

COUNTY STAFFS

BLOUNT COUNTY—Oneonta

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TRACY A. GRAHAM, *Assistant County Agent-ANR*, 1980. B.S., Auburn
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CHEROKEE COUNTY—Centre

CHARLES R. MOODY, *County Agent-ANR*, 1964, 1976. B.S., Auburn
LINDA A. GLASS, *Assistant County Agent-4-H*, 1978. B.S., Alabama A&M
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DAVID E. DERRICK, *Assistant County Agent-ANR*, 1978, 1980. B.S., Auburn

COLBERT COUNTY—Tuscumbia

JERRY L. PARKER, *County Agent-Coordinator*, 1960, 1976. B.S., M.Ed., Auburn
HAROLD E. ROSE, *County Agent-ANR*, 1961, 1976. B.S., M.Ext. Ed., Mississippi State
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CHARLES E. ANDREWS, *Assistant County Agent-ANR*, 1973, 1976. B.S., Tuskegee
CHRISTA L. HALL, *County Agent-HE*, 1950, 1976. B.S., Alabama
TERESA C. McDONALD, *Assistant County Agent-4-H*, 1976. B.S., Alabama A&M
MICHAEL J. BARKER, *Assistant County Agent-4-H*, 1978. B.S., Tennessee

CULLMAN COUNTY—Cullman

BOB G. SPEARS, *County Agent-Coordinator*, 1964, 1976. B.S., Oklahoma State; M.S., Tennessee
PEGGY M. HARRIS, *County Agent-HE*, 1964, 1979. B.S., Montevallo
ELAINE W. COLE, *Associate County Agent-4-H*, 1973, 1978. B.S., Alabama; M.A., Alabama
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DeKALB COUNTY—Fort Payne

CURTIS H. O'DANIEL, *County Agent-Coordinator*, 1976, 1978. B.S., M.Ed., Auburn
TERRY L. SHACKELFORD, *Assistant County Agent-ANR*, 1974, 1976. B.S., Alabama A&M
ANNETTE M. WARDROP, *Assistant County Agent-4-H*, 1977. B.S., Jacksonville State
SANDRA T. COFFEY, *Associate County Agent-HE*, 1972, 1979. B.S., Tennessee

ETOWAH COUNTY—Gadsden

CELESTE H. MARTIN, *County Agent-Coordinator*, 1957, 1980. B.S., M.A., Auburn
ELOISE O. TURK, *County Agent-4-H*, 1970, 1979. B.S., Alabama A&M; M.A.T., Indiana

RAYMOND GREGG HODGES, *Associate County Agent-ANR*, 1975, 1977. B.S., M.S., Mississippi State
MARY L. JORDAN, *Assistant County Agent-4-H*, 1978. B.S., M.S., Auburn
RONNIE W. WHITE, *Assistant County Agent-4-H*, 1978. B.S., Auburn

FAYETTE COUNTY—Fayette

JAMES P. TUCKER, *County Agent-Coordinator*, 1961, 1976. B.S., M.A., Auburn
LANETTA REAL, *Assistant County Agent-HE*, 1980. B.S., N. Alabama; M.S., Alabama
DAVID W. ROBINSON, *Assistant County Agent-4-H*, 1978. B.S. Mississippi State
PAULA I. THREADGILL, *Assistant County Agent-4-H*, 1976. B.S. Alabama

FRANKLIN COUNTY—Russellville

WAYMON RAY PACE, *Associate County Agent-Coordinator*, 1972, 1979. B.S., M.S., Auburn; Ed.S., Mississippi State
JOYCE V. McNUTT, *County Agent-HE*, 1954, 1976. B.S., Auburn
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HENRY M. GOTCHER, *Assistant County Agent-4-H*, 1980. B.S., Auburn

JACKSON COUNTY—Scottsboro

B.T. RICHARDSON, *County Agent-Coordinator*, 1945, 1976. B.S., Auburn
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JEFFERSON COUNTY—Birmingham

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PERCY L. WHITE, *County Agent-4-H*, 1949, 1976. B.S., Alabama A&M; M.Ed., Tuskegee
DAVID W. BRADFORD, *County Agent-ANR*, 1979. B.S., M.S., Auburn
HELEN T. WILSON, *Associate County Agent-4-H*, 1970, 1977. B.S., M.Ed., Alabama A&M
CARRIE LENA SMITH, *County Agent-HE*, 1971, 1977. B.S., Auburn; M.A., Alabama
RHONDA K. BROWN, *Assistant County Agent-4-H*, 1977, 1978. B.S., Auburn; M.A.T., Montevallo
DAVID H. HUBBARD, *Assistant County Agent-ANR*, 1978. B.S., Auburn
EMILY J. SMITH, *Assistant County Agent-4-H*, 1978. B.S., Alabama
JACKIE F. McDONALD, *Associate County Agent-HE*, 1973, 1976, 1980. B.S., Tennessee Tech

LAMAR COUNTY—Vernon

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LAUDERDALE COUNTY—Florence

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CONNIE W. MORROW, *Assistant County Agent-4-H*, 1980. B.S., M.A., Alabama
ROSA A. McAFEE, *Assistant County Agent-HE*, 1979. B.S., N. Alabama, M.S., Alabama
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LAWRENCE COUNTY—Moulton

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MARSHALL COUNTY—Guntersville

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ST. CLAIR COUNTY—Pell City

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HOUSTON COUNTY—Dothan

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LEE COUNTY—Opelika

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MACON COUNTY—Tuskegee

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RUSSELL COUNTY—Phenix City

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TALLADEGA COUNTY—Talladega

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CLARKE COUNTY—Grove Hill

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MAX F. SCOTT, *County Agent-Coordinator*, 1962, 1977. B.S., M.Ag., Auburn
 MIKE M. GAMBLE, *County Agent-ANR*, 1966, 1979. B.S., Mississippi State
 RODIE M. RUFFIN, *Associate County Agent-4-H*, 1973, 1976. B.S., M.Ed., Tuskegee
 ANNIE C. RICHARDSON, *County Agent-HE*, 1952, 1976. A.B., Judson. M.S., Livingston
 DELOIS CARMICHAEL, *County Agent-HE*, 1952, 1976. B.S., M.Ed., Tuskegee
 MARILYN MARIE GALEMORE, *Assistant County Agent-4-H*, 1977. B.S., Auburn

PERRY COUNTY—Marion

JOE E. LASHLEY, *County Agent-Coordinator*, 1961, 1977. B.S., M.Ag., Auburn; Ed.S., Mississippi State
 J. A. BATES, JR., *County Agent-ANR*, 1950, 1976. B.S., Auburn
 RICHARD E. SMITH, *County Agent-4-H*, 1962, 1976. B.S., Alabama A&M; M.Ed., Tuskegee
 EVELYN GRAHAM, *County Agent-HE*, 1950, 1976. B.S., Alabama
 JOYCE N. RICHARDSON, *County Agent-4-H*, 1958, 1979. B.S., Judson

PICKENS COUNTY—Carrollton

EDWARD N. GRAHAM, *County Agent-Coordinator*, 1960, 1976. B.S., M.S., Mississippi State
 WALTER D. POWERS, *County Agent-ANR*, 1966, 1976. B.S., Mississippi State
 THEODIS HENDERSON, *Assistant County Agent-4-H*, 1975, 1976. B.S., Alabama A&M
 HELEN B. HILL, *County Agent-HE*, 1941, 1976. B.S., Montevallo; M.S., Alabama
 LORRAINE K. MEEKS, *County Agent-4-H*, 1957, 1977. B.S., Alabama

SUMTER COUNTY—Livingston

B. B. WILLIAMSON, *County Agent-Coordinator*, 1946, 1976. B.S., M.Ag., Auburn
 MILDRED M. ENNIS, *County Agent-HE*, 1958, 1976. B.S., Tennessee; M.S., Livingston
 GLORIA R. STEINHILBER, *Associate County Agent-4-H*, 1970, 1979. B.S., Montevallo
 THERESA E. THREADGILL, *County Agent-4-H*, 1957, 1976. B.S., Tuskegee
 JEFFREY L. McCLURE, *Assistant County Agent-ANR*, 1978. B.S., Auburn

TUSCALOOSA COUNTY—Tuscaloosa

ALBERT PITTS, JR., *County Agent-Coordinator*, 1952, 1976. B.S., M.Ag., Auburn
 J. B. FIELDS, *County Agent-4-H*, 1954, 1976. B.S., Tuskegee; M.S., Illinois
 ELIZABETH STEWART, *County Agent-HE*, 1945, 1976. B.S., M.S., Alabama
 O'NEAL MASSEY, *County Agent-HE*, 1952, 1976. B.S., M.S., Alabama
 JO ANN H. SMITH, *County Agent-4-H*, 1970, 1979. B.S., M.S., Alabama
 VERA J. WILSON, *Associate County Agent-4-H*, 1966, 1979, 1980. B.S., Alabama A&M
 JAMEY M. CLARY, *Associate County Agent-4-H*, 1974, 1979. B.S., Auburn
 JIMMY W. FARRIS, *Assistant County Agent-ANR*, 1979. B.S., Auburn

WASHINGTON COUNTY—Chatom

THOMAS E. FULLER, *County Agent-Coordinator*, 1969, 1980. B.S., M.S., Auburn
 SARAH H. HAZEN, *Associate County Agent-HE*, 1964, 1976. B.S., Auburn
 PATRICIA ANN LANE, *Associate County Agent-4-H*, 1968, 1976. B.S., Alabama
 ARTHUR L. THREATT, *Assistant County Agent-4-H*, 1980. B.S., Alabama A&M

WILCOX COUNTY—Camden

SOLOMONIA E. REYNOLDS, *County Agent-Coordinator*, 1949, 1976. B.S., Alabama A&M; M.Ed., Tuskegee
 WILLIAM J. HARDY, *County Agent-ANR*, 1954, 1976. B.S., Auburn
 BETTY JEAN HOLLINGER, *Assistant County Agent-4-H*, 1977. B.S., M.A.T., Montevallo

ENGINEERING EXPERIMENT STATION STAFF

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OLAN A. HEMBREE, *Assistant To Director*
JAMES R. WILBANKS, B.M.E., M.M.E., *Director, Auburn Office*
A. HENRY AVERY, B.M.E., M.S.I.M., *Director, Birmingham Office*
RONALD D. ECKHOFF, B.S., *Assistant for*
New Program Development, Birmingham Office
LUELLEN NAGLE, B.S.Ed., *Administrative Assistant, Birmingham Office*

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ENROLLMENT STATISTICS

Table I — Enrollment By Curriculum

Fall Quarter, 1980

SCHOOL OF AGRICULTURE

Curriculum	Undergraduate		Graduate		Total
	Male	Female	Male	Female	
Animal & Dairy Sciences (ADS)	146	68	17	3	234
Agric. Economics & Rural Soc. (AEC)	110	13	18	1	142
Agricultural Science (AG)	50	6			56
Agricultural Engineering (AN)	76	6	7	0	89
Agronomy & Soils (AY)	56	10	34	9	109
Biological Science (BI)	1	4			5
Botany (BY)	3	1			4
Botany & Microbiology (BY)			16	9	25
Entomology (ENT)	11	0			11
Fisheries & Allied Aquacultures (FAA)	46	5	96	12	159
Food Science (FS)	6	2			8
Forestry (FY)	184	20	19	2	225
Forestry Engineering (FYE)	40	1			41
Horticulture (HF)	12	3	4	3	22
Microbiology (MB)	33	31	4	2	70
Marine Biology (MRB)	31	8			39
Landscape & Ornamental Horticulture (OH)	51	49			100
Poultry Science (PH)	10	1	6	6	23
Plant Protection (PLP)	3	2			5
Wildlife Management (WL)	41	21	9	2	73
Wood Technology (WT)	12	0			12
Zoology (ZY)	21	19			40
Zoology-Entomology (ZY)			33	20	53
TOTAL (Agriculture)	943	270	263	69	1,545

SCHOOL OF ARCHITECTURE AND FINE ARTS

Architecture (AR)	426	114			540
Art (AT)			0	1	1
Building Science (BSC)	274	7			281
Industrial Design (IND)	92	15	1	0	108
Interior Design (ID)	8	74			82
Music (MU)	23	35	1	2	61
Regional Planning (RP)			1	3	4
Theatre (TH)	13	23			36
Visual Arts (VAT)	97	234			331
TOTAL (Architecture & Fine Arts)	933	502	3	6	1,444

SCHOOL OF ARTS AND SCIENCES

Applied Mathematics (AMH)	21	13			34
Applied Physics (APS)	7	0			7
Chemistry (CH)	27	15	47	10	99
Criminal Justice (CJ)	79	58			137
English (EH)			18	21	39
Foreign Language - International Trade (FLT)	26	99			125
French (FLF)			1	8	9
General Curriculum - Undeclared (GC)	784	658			1,442
General Curriculum - Anthropology (GAN)	4	4			8
General Curriculum - Art (GAT)	0	9			9
General Curriculum - Biological Science (GBI)	14	25			39
General Curriculum - Chemistry (GCH)	3	2			5
General Curriculum - Comparative Literature (GCL)	0	0			0
General Curriculum - Economics (GEC)	11	5			16
General Curriculum - English (GEH)	22	32			54
General Curriculum - Foreign Language (GFL)	5	29			34
General Curriculum - Earth Science (GGE)	2	1			3
General Curriculum - Geography (GGY)	4	0			4

Curriculum	Undergraduate		Graduate		Total
	Male	Female	Male	Female	
General Curriculum - History (GHY)	38	22			60
General Curriculum - Journalism (GJM)	55	70			125
General Curriculum - Mathematics (GMH)	27	22			49
General Curriculum - Philosophy (GPA)	2	1			3
General Curriculum - Psychology (GPG)	64	120			184
General Curriculum - Political Science (GPO)	52	22			74
General Curriculum - Physics (GPS)	2	0			2
General Curriculum - Religion (GRL)	9	3			12
General Curriculum - Speech Communication (GSC)	70	105			175
General Curriculum - Social Work (GSW)	9	44			53
General Curriculum - Sociology (GSY)	5	18			23
General Curriculum - Theatre (GTH)	0	2			2
Geology (GL)	49	10	15	1	75
History (HY)			29	17	46
Lab Technology (LT)	4	55			59
Medical Technology (MDT)	10	43			53
Mathematics (MH)	3	2	23	8	36
Physics (PS)	38	5	17	2	62
Political Science (PO)			11	3	14
Pre-Dentistry (PD)	77	24			101
Pre-Hospital & Health Services Administration (HA)	37	31			68
Pre-Law (PL)	145	89			234
Pre-Medicine (PM)	215	87			302
Pre-Occupational Therapy (OT)	0	4			4
Pre-Optometry (OP)	13	6			19
Pre-Pharmacy (PPY)	70	99			169
Pre-Physical Therapy (PT)	11	32			43
Pre-Veterinary Medicine (PV)	157	107			264
Psychology (PG)			46	37	83
Public Administration (PUB)	51	29			80
Public Relations - Journalism (PRJ)	20	63			83
Public Relations - Speech Communication (PRS)	32	130			162
Spanish (FLS)			1	7	8
Speech Communication (SC)			12	49	61
TOTAL (Arts & Sciences)	2,274	2,195	220	163	4,852

SCHOOL OF BUSINESS

Accounting (AC)	123	118			241
Business Administration (BA)	4	2	38	26	70
Economics (EC)	13		312	3	31
Finance (FI)	71	45			116
Industrial Management (INM)	91	15			106
Marketing (MK)	138	99			237
Organization Management (OMN)	94	43			137
Personnel Management and Industrial Relations (PIR)	16	20			36
Pre-Business (PB)	902	690			1,592
Transportation (TN)	20	5			25
TOTAL (Business)	1,472	1,040	50	29	2,591

SCHOOL OF EDUCATION

Community College Education (ACC)			1	3	4
Curriculum Supervision (ASC)			5	4	9
Educational Leadership (AED)			46	27	73
Elementary/Secondary Admin. (AES)			19	12	31
Higher Education Admin. (AHE)			20	8	28
Community Agency Counseling (CCA)			0	3	3
Counselor Education (CED)			31	41	72
Public School Counseling (CPS)			0	2	2
Rehabilitation Counseling (CRC)			6	17	23
Student Development (CSD)			4	3	7
Early Childhood Education (EEC)	1	265	3	45	314
Elementary Education (EEE)	12	192	1	37	242
Elementary Reading Specialist (ERG)			2	6	8
Field Laboratory (EX)	33	27			60
General Education (GED)	40	44			84
Health Education (HHE)	2	10	0	2	14
Health and Physical Education (HPE)	35	20	3	2	60
Health, Physical Education and Recreation (HPR)	99	116	9	7	231
Recreation Administration (HRA)	28	38			66
Media Specialist (MSE)			3	22	25

Curriculum	Undergraduate		Graduate		Total
	Male	Female	Male	Female	
Behavior Disturbance Education (RSB)	1	35			36
Early Childhood Education for the Handicapped (RSC)	2	64			66
Learning Disabilities (RSL)			0	7	7
Mental Retardation Education (RSM)	2	54	1	2	59
Rehabilitation & Special Education (RSE)			3	10	13
Rehabilitation Service Education (RSR)	6	48	2	18	74
Speech Pathology Education (RSS)	2	103			105
Art Education (SAT)	1	28			29
English Education (SEH)	4	35	6	22	67
Foreign Language Education (SFL)	1	3			4
Mathematics Education (SMH)	9	22	5	8	44
Music Education (SMU)	38	24	2	4	68
Secondary Reading Specialist (SRG)			0	2	2
Speech Communication Education (SSC)	2	6			8
Science Education (SSE)	22	18	11	7	58
Social Science Education (SSS)	31	28	12	11	82
Theatre Education (STH)	0	1			1
Adult Education (VAD)	4	2	6	5	17
Agricultural Education (VAG)	62	6	8	2	78
Business Education (VBU)	5	44	1	9	59
Distributive Education (VDE)	51	11			62
Home Economics Education (VHE)	0	30	0	8	38
Health Occupations Education (VHO)	1	2			3
Industrial Arts Education (VIA)	13	4	2	1	20
Office Administration (VOA)	1	68			69
Trade & Industrial Education (VTI)	6	2	5	1	14
Vocational & Adult Education (VED)			32	24	56
TOTAL (Education)	514	1,350	249	382	2,495

SCHOOL OF ENGINEERING

Aerospace Engineering (AE)	86	5	10	0	101
Aviation Management (AM)	109	11			120
Civil Engineering (CE)	266	18	20	2	306
Chemical Engineering (CHE)	170	45	31	4	250
Computer Engineering (CPE)	14	4			18
Computer Science (CS)	9	11			20
Electrical Engineering (EE)	457	33	36	0	526
Industrial Engineering (IE)	130	77	18	13	238
Mechanical Engineering (ME)	334	18	18	1	371
Materials Engineering (MTL)	17	3			20
Pre-Engineering (PN)	1,237	225			1,462
Pre-Chemical Engineering (PCN)	123	49			172
Pre-Engineering - Management (PNM)	131	14			145
Pre-Engineering Textiles (PTN)	19	4			23
Textile Chemistry (TC)	4	4			8
Textile Engineering (TE)	9	3			12
Textile Management & Technology (TMT)	20	7			27
TOTAL (Engineering)	3,135	531	133	20	3,819

SCHOOL OF HOME ECONOMICS

Clothing and Textiles (CT)	1	20			21
Consumer Affairs (CA)			3	13	16
Consumer & Family Economics (CFE)	1	17			18
Dietetics (CDP)	0	23			23
Family & Child Development (FCD)	1	95	7	19	122
Family & Child Services (FCS)	0	33			33
Family Resources Management (FRM)	0	18			18
Fashion Merchandising (FM)	3	184			187
Food Service Administration (FSA)	3	6			9
Housing & Equipment (HEQ)	0	3			3
Interior Furnishings & Equipment (IFE)	1	80			81
Nutrition & Foods (NF)	5	62	2	8	77
TOTAL (Home Economics)	15	541	12	40	608

SCHOOL OF NURSING

Pre-Nursing (NS)	3	143			146
Nursing (NUR)	7	75			82
TOTAL (Nursing)	10	218			228

SCHOOL OF PHARMACY

Curriculum	Undergraduate		Graduate		Total
	Male	Female	Male	Female	
Pharmacy (PY)	162	176	10	6	354
TOTAL (Pharmacy)	162	176	10	6	354

SCHOOL OF VETERINARY MEDICINE

Large Animal Surgery & Medicine (VLA)			9	2	11
Pathology & Parasitology (VPP)			4	1	5
Physiology & Pharmacology (VPH)			7	1	8
Small Animal Surgery & Medicine (VSA)			4	1	5
Veterinary Microbiology (VMI)			10	9	19
Veterinary Medicine (VM)	323	136			459
TOTAL (Veterinary Medicine)	323	136	34	14	507

INTERDEPARTMENTAL PROGRAMS

Environmental Health (ENH)	7	8			15
Nutrition (NN)			1	1	2
Physiology (IP)			13	3	16
Sociology (SY)			4	4	8
TOTAL (Interdepartmental)	7	8	18	8	41

TRANSIENTS AND AUDITORS

Transients & Auditors (TR)	34	35	25	25	119
TOTAL (Transients & Auditors)	34	35	25	25	119

ALL UNIVERSITY

Freshmen	2,663	2,066			4,729
Sophomores	2,410	1,582			3,992
Juniors	2,112	1,664			3,776
Seniors	2,268	1,489			3,757
Fifth Year	181	66			247
Other Undergraduates	188	135			323
Master's			632	518	1,150
Educational Specialist			2	11	13
Doctoral			293	161	454
Post-Doctoral			3	2	5
Other Graduates			87	70	157
GRAND TOTAL	9,822	7,002	1,017	762	18,603

TABLE II—ENROLLMENT OF ALABAMA STUDENTS BY
COUNTIES
FALL QUARTER, 1980

County	Male	Female	Total
Autauga	59	34	93
Baldwin	137	96	233
Barbour	51	26	77
Bibb	8	3	11
Blount	29	15	44
Bullock	30	21	51
Butler	26	25	51
Calhoun	175	87	262
Chambers	123	124	247
Cherokee	33	10	43
Chilton	37	14	51
Choctaw	9	7	16
Clarke	22	23	45
Clay	24	11	35
Cleburne	17	6	23
Coffee	111	74	185
Colbert	62	32	94
Conecuh	17	12	29
Coosa	15	11	26
Covington	79	58	137
Crenshaw	20	14	36
Cullman	67	37	104
Dale	92	57	149
Dallas	66	47	113
DeKalb	67	34	101
Elmore	89	57	146
Escambia	74	59	133
Etowah	159	99	258
Fayette	15	4	19
Franklin	20	7	27
Geneva	35	18	53
Greene	19	15	34
Hale	12	10	22
Henry	24	17	41
Houston	171	118	289
Jackson	60	40	100
Jefferson	1,144	865	2,009
Lamar	9	3	12
Lauderdale	123	49	172
Lawrence	17	5	22
Lee	918	847	1,765
Limestone	55	29	84
Lowndes	18	12	30
Macon	49	54	103
Madison	560	436	998
Marengo	31	21	52
Marion	39	10	49
Marshall	119	76	195
Mobile	310	248	558
Monroe	51	25	76
Montgomery	510	453	963
Morgan	185	122	307
Perry	17	6	23
Pickens	21	7	28
Pike	38	33	71
Randolph	70	60	130
Russell	131	121	252
St. Clair	25	37	62
Shelby	62	12	74
Sumter	12	6	18
Talladega	127	85	212
Tallapoosa	108	127	235
Tuscaloosa	47	28	75
Walker	38	25	63
Washington	11	6	17
Wilcox	16	2	18
Winston	15	6	21
TOTAL (Alabama)	5,932	5,140	12,072

TABLE III—ENROLLMENT OF STUDENTS BY STATES
AND TERRITORIES*
FALL QUARTER, 1980

State	Male	Female	Total
Alaska.....	1	0	1
Arizona.....	12	4	16
Arkansas.....	16	8	24
California.....	57	16	73
Colorado.....	9	2	11
Connecticut.....	23	10	33
Delaware.....	6	7	13
District of Columbia.....	6	1	7
Florida.....	1,082	798	1,880
Georgia.....	1,167	994	2,161
Hawaii.....	3	2	5
Idaho.....	2	0	2
Illinois.....	41	20	61
Indiana.....	20	7	27
Iowa.....	9	1	10
Kansas.....	3	4	7
Kentucky.....	120	49	169
Louisiana.....	54	40	94
Maine.....	1	3	4
Maryland.....	52	22	74
Massachusetts.....	13	5	18
Michigan.....	26	12	38
Minnesota.....	1	1	2
Mississippi.....	51	24	75
Missouri.....	19	6	25
Montana.....	2	3	5
Nebraska.....	1	1	2
Nevada.....	3	2	5
New Hampshire.....	6	0	6
New Jersey.....	53	21	74
New Mexico.....	7	1	8
New York.....	97	43	140
North Carolina.....	120	66	186
North Dakota.....	2	0	2
Ohio.....	58	19	77
Oklahoma.....	8	3	11
Oregon.....	4	1	5
Pennsylvania.....	41	16	57
Rhode Island.....	6	1	7
South Carolina.....	61	44	105
South Dakota.....	1	0	1
Tennessee.....	255	198	453
Texas.....	48	28	76
Utah.....	5	0	5
Virginia.....	105	66	171
Washington.....	10	2	12
West Virginia.....	12	8	20
Wisconsin.....	16	5	21
Wyoming.....	1	0	1
TOTAL—Other States.....	3,716	2,564	6,280
TOTAL—All States.....	10,648	7,704	18,352
United States Territories & Possessions			
Puerto Rico.....	5	1	6
Virgin Islands.....	1	0	1
TOTAL—U. S. Territories & Possessions.....	6	1	7

*These figures refer to the students' home addresses when accepted for admission as opposed to their fee status.

TABLE IV—ENROLLMENT OF STUDENTS BY FOREIGN
COUNTRY*
FALL QUARTER, 1980

Foreign Country	Male	Female	Total
Argentina	1	0	1
Bahamas	3	0	3
Bangladesh	7	0	7
Belgium	2	1	3
Bolivia	1	0	1
Brazil	2	1	3
Canada	2	2	4
Chile	0	1	1
China (Taiwan)	52	21	73
Colombia	3	1	4
Costa Rica	1	1	2
Cuba	1	0	1
Dominican Republic	1	1	2
Egypt	3	1	4
El Salvador	0	1	1
France	0	1	1
Germany	0	1	1
Ghana	1	0	1
Greece	4	0	4
Guatemala	0	1	1
Guyana	1	0	1
Honduras	1	1	2
Hong Kong	2	1	3
India	20	1	21
Indonesia	3	0	3
Iran	6	2	8
Iraq	1	0	1
Ivory Coast	1	0	1
Jamaica, W. I.	2	0	2
Japan	2	0	2
Jordan	2	1	3
Korea	3	0	3
Kuwait	2	1	3
Lebanon	0	1	1
Malaysia	5	1	6
Mexico	2	0	2
Nepal	1	1	2
Nicaragua	1	0	1
Nigeria	4	1	5
Pakistan	4	1	5
Panama	7	2	9
Paraguay	0	1	1
Peru	1	0	1
Philippine Islands	1	1	2
Portugal	0	1	1
Singapore	1	0	1
South Africa	3	0	3
Sri Lanka	1	1	2
Swaziland	1	1	2
Sweden	0	1	1
Sudan	4	0	4
Tanzania	1	0	1
Thailand	6	2	8
United Kingdom	10	2	12
Uruguay	0	1	1
Vietnam	2	0	2
Yugoslavia	1	0	1
TOTAL—Foreign Countries	185	59	244
TOTAL STUDENTS ENROLLED Fall Quarter, 1980	10,839	7,764	18,603

*These figures refer to the students' home addresses when accepted for admission as opposed to their fee status.

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